

BEFORE THE  
CALIFORNIA ENERGY COMMISSION

In the Matter of: )  
 ) Docket No. 09-ALT-1  
AB 118 2010-2011 )  
Investment Plan\_\_\_\_\_ )

Staff Workshop for the 2010-2011 Investment Plan  
(Natural Gas and Propane Vehicles)

Long Beach City Hall Council Chambers

Long Beach, California

FRIDAY, SEPTEMBER 18, 2009

9:00 a.m.

Reported by:  
Lee Miller  
Certified Electronic Reporter

Staff Present:

Leslie Baroody  
Peter Ward  
Tim Olson  
Pilar Magana

**Also Present**Presenters

Lesley Brown-Garland, Western Propane Gas Association  
Terry Karges, Roush Performance Products  
Curtis Donaldson, Clean Fuel USA  
Rick Teebay, County of Los Angeles Department of Public Works  
Robert Vandenveld, Honda  
Tim Standke, IMPCO Technologies  
Dwight Hanson, Cummins Westport  
Jim Moore, Emission Solutions  
Thomas Jelenic, Port of Long Beach  
Mike Eaves, Clean Energy  
Herb Burnett, Burnett & Burnett  
Bill Zobel, Trillium  
Eric Montague, Prometheus Energy  
Ken Brennan, PG&E  
Ron Goodman, SoCal Gas

Public

David Bruderman  
Ron Orr

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Leslie Baroody, CEC

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Peter Ward, CEC

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## 1 P R O C E E D I N G S

2 SEPTEMBER 18, 2009

9:00 a.m.

3 MS. BAROODY: Well, welcome to the Long Beach City  
4 Hall and to the California Energy Commission's third in a  
5 series of workshops for the 2010-2011 Alternative and  
6 Renewable Fuel and Vehicle Technology Investment Plan. We  
7 just really appreciate you taking the time to be here with  
8 us today and we also welcome those of you listening online.

9 We have had some very successful and informative  
10 workshops in the past several weeks. Last week, we were in  
11 Diamond Bar for the Electric Drive Workshop, and then this  
12 past Monday and Tuesday, we had a two-day Biofuels Workshop  
13 in Sacramento. I expect today will be quite productive, as  
14 well.

15 First, I'd like to introduce our team from  
16 Emerging Fuels and Technology Office of the Fuels and  
17 Transportation Division. I'm Leslie Baroody. I'm Project  
18 Manager for the 2010-11 Investment Plan. With me is Charles  
19 Smith. Charles. He's Assistant Project Manager. Peter  
20 Ward and Tim Olson, they authored last year's Investment  
21 Plan and are experts on alternative transportation fuels and  
22 technologies, and Peter will be speaking shortly. Tim and  
23 Peter, and other staff here, will be moderating our panel  
24 today. Pilar Magana, who many of you met already, is our

1 WebEx expert and assisting us with PowerPoint today. Also,  
2 we have Miles Roberts right here. He's assisting staff and  
3 is involved currently with the Natural Gas Solicitations.  
4 So this meeting is being publicly broadcast via WebEx, and  
5 the transcript and audio will be posted on our website.

6 Well, the main purpose of today's workshop is for  
7 the Energy Commission staff to acquire information needed to  
8 provide the basis for allocating \$100 million in AB 118  
9 funds. We need updated information on natural gas and  
10 propane vehicle technology, target markets, infrastructure  
11 costs and needs, and customer costs. This workshop is just  
12 the beginning of the data collection process and will  
13 continue with the review of docketed materials, subsequent  
14 dialogue, and additional input.

15 We have a rather full agenda today and we want to  
16 have time for public comments, both from those in the  
17 audience and on WebEx. Peter Ward will begin with an  
18 overview of the AB 118 Investment Plan process, and then  
19 we'll start off with presentations on the Propane Industry  
20 overview at 9:30, followed by the Light Duty Natural Gas  
21 Vehicles at 11:00. We'll have an hour -- half hour for  
22 public comment before we adjourn for lunch at noon. Then,  
23 at 1:00, we'll begin the Medium and Heavy Duty Natural Gas  
24 Vehicle speakers, followed by the Fuel Infrastructure Panel  
25 at 2:30. At 3:00 o'clock, we'll have presentations on

1 Biomethane Production, followed by a public comment session  
2 at 3:45. So if all proceeds according to schedule, we  
3 should be done by about 4:45 or so.

4 As I mentioned before, we've -- this is the third  
5 in a series of workshops that we've had in September. The  
6 next one will be on Hydrogen Transportation Technology and  
7 that will be held at the California Energy Commission on  
8 September 29th. We're also -- we're also planning an  
9 Electric Drive infrastructure workshop in San Francisco  
10 probably the second week or so in October. Just check our  
11 website for further details.

12 Well, the next step in this whole Investment Plan  
13 process is for staff to analyze and incorporate all of the  
14 information we gather at these workshops, and we hope to  
15 produce a plan, Investment Plan, just in time for the  
16 Advisory Committee meeting in probably late November. We  
17 will then have two more public workshops for the Draft  
18 Investment Plan followed by one more Advisory Committee  
19 meeting in December. And we hope to have the final draft by  
20 January of 2010. So if you're not already on our list  
21 serve, I encourage you to sign up on the bottom right-hand  
22 corner under AB 118 -- the AB 118 Investment Plan. So thank  
23 you for your attention. And now, I would like to introduce  
24 Peter Ward. Thanks.

25 MR. WARD: Good morning, everybody. Thank you for

1 coming. This is, as Leslie says, the third in a series of  
2 workshops we're having for the 2010-2011 Investment Plan.  
3 Yes, and you may recall, we just did adopt an Investment  
4 Plan in April and, of course and turned kind of on a dime I  
5 think actually pretty quickly and deftly to offer that  
6 funding and try to get on the same path with the economic  
7 stimulus funding that was made available in Washington. And  
8 so we tried to make sure that those entities in California  
9 with projects could apply to our program to -- to apply for  
10 the required match funding for the federal stimulus  
11 packages. We spent quite a bit of time developing that  
12 solicitation, evaluating those proposals for the -- all the  
13 different solicitations. There was transportation  
14 electrification, battery, and vehicle component  
15 manufacturing, Clean Cities, bio refineries in the Biomass  
16 Program, and a new solicitation that was [inaudible] and I  
17 understand that was for \$400 million and that's for the new  
18 technology developments coming along, and I understand that  
19 will result in a new agency within the Department of Energy  
20 for ongoing result. I believe that we can bring them the  
21 list of the best technologies on a very systematic basis.

22 I'd like to go over a few things just quickly  
23 where we have been and where we are going, but first I  
24 really would like to thank the City of Long Beach for  
25 hosting us here in their Council Chambers and particularly

1 Bob -- Mayor Bob Foster, who actually helped us make this  
2 available and at no cost to the State of California, which  
3 is something we truly appreciate these days.

4 I'd like to go forward with basically some  
5 statistics from the Nation-State of California. As you  
6 folks know, we are still a growing state, despite the  
7 recession. We have nearly 37 million people and are the  
8 eighth largest economy, depending on the inclination of the  
9 French, as I've often heard. GHG emissions of 440 million  
10 metric tons measured in 2004, and I think we are up from  
11 that, as we are still going the wrong direction in GHG  
12 production, 7.2 percent of the U.S. Emissions, and the tenth  
13 largest emission emitter on a global scale. Transportation  
14 accounts for approximately 38 percent of those GHG emissions  
15 coming from the 26 million light-duty vehicles, cars,  
16 trucks, and nearly a million trucks in California. Our  
17 annual fuel consumption in California, of course, largest in  
18 the nation, is 20 billion gallons a year. That's well over  
19 a billion and a half gallons each month, 16 billion for  
20 gasoline, 4 billion for diesel, and that makes us the third  
21 largest consumer of vehicle fuels, third to China and the  
22 U.S., other nations like our Nation-State.

23 The AB 118 program that we're going to be  
24 discussing today had its foundation in the development of  
25 the California Alternative Fuels Plan. You folks may recall



1 that we were developing that prior to this legislation being  
2 passed. It was adopted shortly after this legislation was  
3 signed. It does seem that this is a natural flow from that  
4 Alternative Fuels Plan, where we -- we developed -- we  
5 actually measured the goals that had been set previously to  
6 see if we could attain those with a moderate development  
7 strategy. I'm happy to say that, with us today is Tim  
8 Olson, who was the author, primary author, of that  
9 Alternative Fuels Plan and knows it backwards and forwards,  
10 and so I'm happy to have Tim with us to answer any of those  
11 questions on that plan, which is kind of the guiding  
12 document for AB 118 as we try and achieve those goals that  
13 were very ambitious. We did find that -- and this is one of  
14 the first times this was used, the full-fuel-cycle analysis,  
15 showed that alternative fuels are a greenhouse gas benefit  
16 compared to petroleum fuels, gasoline and diesel. Nearly  
17 all of the fuels are roughly 20 percent lower carbon than  
18 gasoline and diesel baseline. And so there's kind of a no  
19 reflex there and [inaudible] alternative fuels to reduce our  
20 petroleum consumption, our criteria emissions, and help  
21 develop the economy and additional jobs. The goals we found  
22 that were attainable were to displace or actually to  
23 increase our alternative fuel use to 9 percent in 2012, 11  
24 percent in 2017, and 26 percent in 2022. This would result  
25 in the displacement of 4 billion gasoline gallon equivalents

1 by the year 2020 of petroleum fuels.

2           Natural gas and propane can make a large  
3 contribution to this goal, with correspondingly large  
4 reductions in GHG and air pollution, actually natural gas  
5 being the largest alternative fuel as far as use right now,  
6 and propane has great opportunities, as well, in California  
7 and across the United States, and it was very successful  
8 with the federal stimulus.

9           The key policy objectives, pretty much in ranked  
10 order, given our statute, were GHG reduction, GHG emissions  
11 to 1990 levels by the year 2020, and reduction of 80 percent  
12 below 1990 levels by the year 2050. The latter goal is an  
13 Executive Order signed by Governor Schwarzenegger, the  
14 former is the goal we have in AB 32, the Global Climate  
15 Solutions Act signed in 2006. Petroleum reduction, as I  
16 mentioned, 15 percent below 2003 levels by 2020. That's our  
17 goal for petroleum reduction. This can only really be  
18 achieved by the increased use of non-petroleum alternative  
19 fuels. Alternative fuel use, 20 percent is our goal for  
20 2020, and 30 percent by 2030, established in the 2076 --  
21 California's -- Reducing California's Petroleum Dependency  
22 Report and jointly adopted by the Air Resources Board and  
23 the California Energy Commission.

24           In-State biofuels will play a role in this, as  
25 well. There's an error in this readout, but it's 1 billion

1 gasoline gallon equivalents by 2010 and 2 billion gasoline  
2 gallon equivalents by 2050. Now, that's production in the  
3 state. That's use and we're hoping -- we have very  
4 ambitious goals for the production of the amounts that we  
5 use in California, and those are 20 percent of the biofuels  
6 used in the state by 2010, 40 percent by 2020, and 75  
7 percent of all biofuels used in the state by 2050 will be  
8 produced in our state.

9 California is well situated for the production of  
10 biofuels, and we have adopted in our program the kind of  
11 overarching mantle of going about this in the most  
12 sustainable way possible, that is taking the cap for all the  
13 environmental impacts that could result from this, and it's  
14 really consistent with the Air Resources Board Low Carbon  
15 Fuel Standard, and we have, basically at the Commission,  
16 have got to set a new standard for sustainability. On our  
17 staff, Jim McKinney is leading the charge and has a  
18 sustainability working group, and is working this issue on a  
19 continuing basis as we go forward in this program. The  
20 effects of that will be that we will be developing fuels  
21 that will be much more sustainable in the future than we  
22 have in the past, and just to make sure that we are on  
23 track, and do no harm as we go forward compared to what has  
24 taken place in the past.

25 Now, turning to the Renewable Fuel Vehicle

1 Technology Program, I'll call it the AB 118 Program for  
2 shortness, or the Alternative Fuel Program. As I mentioned,  
3 it was established by Assembly Bill 118, authored by  
4 then-Speaker Fabian Nuñez. It was subsequently amended by  
5 AB 109, also authored by the Speaker at the time. And this  
6 is the overriding purpose that we've been given in statute,  
7 and that is the emphasis of this program is to develop and  
8 deploy innovative technologies that transform California's  
9 fuels and vehicle types to help attain the state's climate  
10 change policies. And it's interesting because, there is a  
11 large regulatory movement across the state with AB 32, given  
12 unprecedented authority to Air Resources Board to establish  
13 this. There is the Pavley Bill, which I believe controlled  
14 CO2 out the tailpipe. There is the Low Carbon Fuel  
15 Standard, as well. All of these are regulatory mechanisms  
16 that we are hoping to employ, but as we -- as we learned in  
17 the Alternative Fuels Plan, it would be necessary to employ  
18 market mechanisms in addition to, and complimentary with,  
19 the regulatory framework that has been established in  
20 California. We can't achieve our goals strictly from a  
21 regulatory sense, so to my way of thinking, and to our way  
22 of thinking at the Commission, the market mechanism will be  
23 a very, very large contributor to achieving those goals, and  
24 the AB 118 program is a mechanism that's well funded, that  
25 will be very useful in helping to complement those programs.

1 I think the market will help us fashion this in a way we  
2 could not do just by regulatory means.

3 And the funding that I mentioned, we have up to  
4 \$100 million per year for seven and a half years, \$75  
5 million was allocated by the -- in the budget process for  
6 '08-'09, \$101 million for '09-'10, so -- at this point, and  
7 in the last Investment Plan, we approved allocations for up  
8 to \$176 million for the first two years that that Investment  
9 Plan covered. This next Investment Plan that we are here  
10 talking about today will be hopefully upwards of \$100  
11 million. We're not certain of that until the budget  
12 actually is adopted, by statute supposedly by June 15th of  
13 2010, and we have been a little late in the past, but  
14 nevertheless, we hope to have our Investment Plan intact and  
15 ready to go for budget hearings in the spring of next year.  
16 I think that would be -- put us in good stead to make sure  
17 that none of the money gets swept and that the money can be  
18 actively used in that fiscal year and right after the  
19 signing of the budget. The funding is to develop, produce,  
20 manufacture, and deploy alternative and renewable fuels,  
21 advanced vehicles, vehicle efficiency improvements, for  
22 on-road and non-road applications, emphasize workforce  
23 training and job creation, and to foster education promotion  
24 and technology centers of excellence, prepare environmental,  
25 market and technology assessments. We will be informing

1 this program as we go. In last year's development of the  
2 Investment Plan, we did not have access to our funding, to  
3 the point that we were developing the Investment Plan based  
4 on existing staff resources, and so we have set the goal to  
5 make sure that this is a very well-informed program as we go  
6 out into the future, year to year. That is to -- to assess  
7 the market for alternative fuels, technology development for  
8 alternative fuels and vehicles, and to monitor the  
9 environmental profile, the sustainability of these fuels as  
10 we go forward.

11 We are the entity that is doing all the lifecycle  
12 assessment for the Low Carbon Fuel Standard at the Air  
13 Resources Board, so we will be continuing that effort to  
14 inform our program in the future as we are guided by the  
15 regulation of the Low Carbon Fuel Standard, as well. And so  
16 we were the ones that kind of started that ball rolling. We  
17 aim to take it up and continue that ball rolling to make  
18 sure that we can do the proper assessment on a further  
19 lifecycle basis for all the fuels as we go forward, so we  
20 will have no regrets with the fuels that we develop. This  
21 is the Investment Plan for the first two years. The first  
22 category is electric drive, 46 million, hydrogen, 40  
23 million, ethanol, 12 million, renewable diesel and  
24 biodiesel, \$6 million, and natural gas, including \$10  
25 million for biomethane production in California, 43 million,

1 propane, \$2 million for vehicles, market development and  
2 program support, which I mentioned, \$27 million, totaling  
3 \$176 million from the first two year Investment Plan.  
4 Previous natural gas and propane funding and the more finer  
5 detail, light-duty natural gas vehicles, \$2 million for  
6 vehicle incentives, medium and heavy-duty natural gas  
7 vehicles for port trucks, school buses and other vehicles,  
8 23 million, \$8 million for natural gas fueling station  
9 installations. This could include, also, the refurbishment  
10 of existing natural gas infrastructure, as we see that as a  
11 very key function to protect the investments we've already  
12 made, and to help refurbish and possibly expand those  
13 existing resources that we have spent good money in  
14 establishing. And particularly for those entities that are  
15 really cash strapped, the public agencies, the school bus  
16 districts, and the cities and counties in the state that  
17 would like to keep their natural gas programs going but they  
18 may need to recertify tanks or to upgrade their systems.  
19 And so we want to make some funding available, at least in  
20 the first two years of this program, to make sure that this  
21 good investment we made in the past is continued forward.  
22 Biomethane production plans, \$10 million. This is an area  
23 that I think California is -- has been ahead of the curve.  
24 I noted in the solicitations that there is no -- there was  
25 no funding out of this billions of dollars going for -- for

1 federal stimulus, there was actually no allocation for  
2 biomethane production. California is well situated. We  
3 have a lot of waste resources that we could properly  
4 utilize, and U.S. EPA has identified biomethane production  
5 and use as a -- as a twofer, if you will, and that is that  
6 biomethane basically is trapping the gases from release into  
7 our environment. Just to capture those and to utilize those  
8 out the tailpipe is another aspect of this, so it is in two  
9 aspects a reducer of global climate change emissions.  
10 Medium and heavy-duty propane school buses and other  
11 vehicles -- actually, I think light-duty and the pickup  
12 trucks were included in this too, a \$2 million allocation.  
13 Our next steps are the ongoing evaluation of proposals for  
14 the folks -- economic stimulus funding, particularly those  
15 that were successful. To be very frank, we were very  
16 disappointed because after all these years, California had  
17 some funding to offer for federal match programs, and I  
18 worked in the Clean Cities Program for five years as the  
19 coordinator for the state, and we really didn't have much to  
20 match. And now that we did, our offerings were not really  
21 taken up as well as I had hoped. I'm hoping that things  
22 will change in the future and maybe there will be additional  
23 allocations to come. But we spent an awful lot of time  
24 trying to match that up and leverage the excellent funding  
25 we have here in California, to match it up and leverage that



1 potential for California. We weren't as successful as I'd  
2 hoped, but we're going to be optimistic still, and we as a  
3 state have a lot to look forward to from the funding that we  
4 have in this program. We'll be preparing a California-based  
5 solicitation in accordance with the current Investment Plan,  
6 that is that one that was adopted on April 22nd, Earth Day,  
7 and this will be decidedly for California. And I think  
8 you'll be seeing that -- we're preparing those now. There  
9 will be several. And I think we'll see those released  
10 within weeks, not months, and I'm hoping to actually have a  
11 quick turnaround for proposals. At least to my way of  
12 thinking, I think a lot of folks have been anxiously  
13 awaiting this type of thing and we've lost a bit of time  
14 with the federal stimulus dance that took place. But at  
15 this point, I think everybody is primed and ready to go, and  
16 we saw a lot of good projects from California. And so we're  
17 hoping we can accomplish this with a fairly quick  
18 turnaround, that is development of proposals within  
19 approximately one month, get them back so that we can  
20 actually get this money on the street. It's our interest to  
21 get that money on the street because it's really doing us no  
22 good sitting in the Controller's Office right now. So we  
23 would really like to get that money out and well in advance  
24 of the finalization of our Investment Plan for the next  
25 fiscal year. And that's what we're here for today is to

1 update the Investment Plan for the 2010-2011 time frame, so  
2 I appreciate you all coming. This is really going to be  
3 helpful. We want to get all your input. I want to mention  
4 that we have opened a docket, and we'd like to get your  
5 formal comments submitted to our docket. That will help  
6 guide us in the development of this next Investment Plan.  
7 And on our website, we'd like to make sure that you folks  
8 are all informed on a timely and routine basis by signing up  
9 for our list serve that is available on our website. And  
10 that is in the lower right-hand corner of our web page. I  
11 encourage you all to sign up. We will notify you  
12 automatically of any -- any releases of paper solicitations  
13 or upcoming workshops in the future. So again, thank you  
14 all for coming, and I look forward to a good workshop today.  
15 Thank you.

16 MS. BAROODY: Thank you, Peter. Thanks, Peter.

17 Our next speaker today is Lesley Garland -- Lesley  
18 Brown-Garland. Lesley, if you just want to go -- that would  
19 be great. Thanks.

20 MS. BROWN-GARLAND: [Inaudible.]

21 MS. BAROODY: Sure, go ahead.

22 MS. BROWN-GARLAND: Good morning. My name is  
23 Lesley Garland. I'm the president and CEO of the Western  
24 Propane Gas Association, which represents about 120 propane  
25 companies that operate in the state of California.

1 California is the second largest consumer of propane in the  
2 nation, and we -- depending on the numbers you look at,  
3 you're the fourth largest user of propane as an engine fuel  
4 in the nation. Today we have a few panelists here to tell  
5 you a little bit about what the propane industry is going to  
6 be offering in terms of alternative fuel vehicles in the  
7 future. I'd just like to say thank you to the Energy  
8 Commission for having us here. A few months ago, when the  
9 first round of funding decisions were being made, I came and  
10 I used the analogy of The Little Engine That Could, the  
11 children's story about the little engine that was coming up  
12 to the mountain saying, "I think I can, I think I can, I  
13 think I can." Our industry obviously got a very, very small  
14 piece of the pie compared to a lot of the other of our  
15 brother and sister alternative fuels because we do honestly  
16 have only a few vehicle offerings. We are a very niche  
17 market that has -- we work out really well for some people,  
18 and for other people we are not even an option that they  
19 should consider, and we totally wrap our arms around that.  
20 We're still that little engine that could, but I think after  
21 you listen to Curtis Donaldson and Terry Karges from Roush  
22 today, you'll get a little bit more feeling that that little  
23 engine is about to crest the top of the hill and start  
24 coming down the mountain and have a lot more to offer. So  
25 thank you. Thank you for a few minutes of your time, and

1    thank you to the Energy Commission for your willingness to  
2    allow us to contribute to the process.

3               MS. BAROODY:  Thank you.  We'll take a brief  
4    minute here.  We're going to turn the podium around, so  
5    people speaking will face this way.

6               MR. KARGES:  Good morning.  I'm Terry Karges,  
7    Senior Vice President from Roush.  We are a -- an engine  
8    development company, and I guess pointing to The Little  
9    Engine That Could, we -- actually, with two buildings with  
10   30 dynamometers each, we hope to be the big engine that  
11   will.  We are Ford Motor Company's -- among other things, we  
12   are Ford Motor Company's primary power train advanced  
13   engineering development company, a Tier 1 engine development  
14   company, and have been for about 35 years.  So in setting  
15   the stage for what we are doing and what we have been doing,  
16   it's important to point out, I think, that we have been, as  
17   an engine development company now for almost three and a  
18   half years, four years, working on the development of a  
19   propane system for Ford trucks, specifically targeting the F  
20   series and then into the E series vans, and then eventually  
21   into the E-450.  And our research shows that that is where  
22   we can make the most impact.  This journey began with the  
23   advent of PERC -- the Propane Energy and Research Council --  
24   working with us to develop uses for propane.  But first some  
25   background.

1           We're a global entity. We've got about 2500  
2 people in our facilities worldwide. In Livonia, Michigan,  
3 there are 41 buildings employing these folks, almost all of  
4 them engaged in one phase or another of engineering in our  
5 primary -- and activity of our engineering, manufacturing.  
6 We're the world's largest racing company. We're not using  
7 propane there, but -- just yet anyway.

8           MR. OLSON: Not yet.

9           MR. KARGES: We will. And an aftermarket  
10 performance products division. We are engaged in a number  
11 of -- virtually anything that you want to do to an  
12 automobile, we are -- we are capable of providing that  
13 support. Vehicle integration testing, vehicle assembly,  
14 concept design through our own clay studios, but especially  
15 in the engine -- our forte is engine development.  
16 Obviously, in our fleet research, our goal was understanding  
17 what our prospective fuel customers wanted. And that always  
18 begins with costs on their side and then certainly on the  
19 green initiatives. And it helps us deliver a product  
20 exceeding the customer expectations.

21           And what are they looking for? What we find is  
22 that they're looking for the green image, positive impact on  
23 environment, public awareness, the multiple solutions across  
24 the company. No affect on customer satisfaction, and we  
25 have achieved that, and in many ways, we've vastly reduced

1 operating costs. And then certainly in management groups  
2 in the -- in the fleet operations, especially working with  
3 some of the companies yesterday, a fellow that operates  
4 13,000 trucks and vans, his primary goal was -- his primary  
5 goal was how can he reduce his budget, but also how can he  
6 get into something that does not reduce horsepower, does not  
7 reduce torque or towing capacity. Fuel availability is  
8 certainly a major cost -- a major issue with them, and with  
9 our partners at PERC and Clean Fuel and a number of the gas  
10 companies, we've been able to overcome any issues on that.  
11 Reduced operating costs are a given in what we've been able  
12 to demonstrate. Reliability and durability are really what  
13 we bring to the table. We can engineer something. In fact,  
14 we've -- we've been able to simplify the system. The fuel  
15 system itself has 13 pieces. But it took us three years to  
16 get there and almost \$5 million. So as simplistic as the  
17 solution sounds, it was a little -- a little exercise  
18 getting there. Operating range of the vehicle, certainly a  
19 big -- a big issue, and we have several different tank sizes  
20 now that we're offering. Warranty, the fuel system does not  
21 affect factory warrant, and we provide a 3/36 on it. So --  
22 and in fact, any of the Ford dealerships in the country,  
23 3000 Ford dealerships, are able to use their diagnostics to  
24 do any testing or checking on vehicles for -- to find a  
25 solution if they're having a problem. That's a huge service

1 advantage for us. But again, it goes back to our OE  
2 engineering roots. Fuel choices, all electric, hybrid  
3 electric. I won't go into that. Folks are going to talk  
4 about that later on. But we do think we have a leg up on  
5 those. Biodiesel, we're confident we have -- we have some  
6 advantages there. CNG, certainly in startup costs, in that  
7 we believe we have an advantage. And on propane, third most  
8 popular fuel in the world behind gas and diesel. More than  
9 90 percent of the propane is produced right here in North  
10 America. There is no power loss with liquid propane  
11 injection, which is the system that we use and have created.  
12 The octane rating is 105, which doesn't require high  
13 compression engines for good performance -- a huge  
14 opportunity there -- and operates at a low 200 pounds in  
15 liquid form. And there's an extensive fueling network  
16 across the country, which we're currently mapping because we  
17 have discovered with the number of -- there are published  
18 reports and then there are unpublished folks that are  
19 selling it to the tune of 10- to 15,000 other locations that  
20 are available. Fleet, however, isn't looking for that.  
21 They're looking for refueling in the evenings. But in a  
22 broader-based use of the vehicles, we're confident we can  
23 show them where they can get gas. We -- I drive a truck  
24 myself everywhere, and I've never had to map out where I'm  
25 going to get fuel. I can find fuel anywhere along the main

1 roads in California. The right fuel that does it all for  
2 your work truck or van, I think Curtis is going to go into  
3 this in a little more -- in depth, but it is one of the  
4 greenest fuels on the market. Reduces dependence on foreign  
5 oil, no loss of power, available everywhere, got range, it's  
6 reliable and safe, and it's compatible with the  
7 manufacturer's warranties. Big advantage. Compact -- the  
8 impact on environment, 18 percent reduction in greenhouse  
9 gases, 20 percent in Nox emissions, 60 percent reduction of  
10 carbon monoxide emissions, and EPA and CARB certified on our  
11 first engine, which was the 5.4 Ford platform engine on an F  
12 series vehicle. We did that on an F-150, and then in our  
13 research, we've known that the F-250 and F-350 medium-duty  
14 trucks were larger fleet requirement. So we have -- we have  
15 done a lot of our development work on that. We spent \$5  
16 million getting to the first one, and now we're in the  
17 process of spending another \$5 million to finish the -- the  
18 F-250, F-350, and the E-150, 250, 350, and then eventually  
19 the E-450 Cutaway. The fleet's looking at \$2- to \$3000 a  
20 year savings, lower cost of propane, some greatly reduced  
21 maintenance costs. We suggest that the fleets are able  
22 to -- the fleets follow the factory manuals on oil changes  
23 and tune-ups and that. We're finding that the fleets are  
24 double and tripling the time between the oil changes because  
25 of the clean fuel. Elimination of spillage and theft is



1 reduced. Most thieves don't have a way to hook up, and  
2 with the elimination of the spillage with a screw-on, it's  
3 tough to miss. The tank offerings, shown here we have a  
4 [inaudible], which has been offered on the -- on the F-150.  
5 That has now been -- is now being replaced with a tank that  
6 will fit where the Ford gasoline tank is. So we get a range  
7 from 450 from the in-bed tank, and then the under-bed would  
8 be 250 -- 225 to 250. And as it says, factory fuel gauges  
9 are working. We have done all our work on the 5.4 V8, as I  
10 mentioned. Same horsepower and torque loadings. No loss of  
11 towing, and then our fuel system components. The fuel rail  
12 assembly, aluminum fuel rail, and the high-pressure fuel  
13 injectors. Fuel tank assembly, pump with a multi-valve  
14 check valve. Fuel lines, air inlet system, inlet  
15 calibration system, in integration with factory systems.

16           What we have found is that when we went into this  
17 we were being overly cautious on the installation of these  
18 systems because that's the way we are as engineers. What  
19 can go wrong? Let's go there first. And what we're finding  
20 is that any Ford mechanic, any qualified Ford mechanic,  
21 especially at the master mechanic level, we can send them  
22 the kit and they can do an install. If they can take a kit  
23 off, they can put this one on.

24           As I've said, three years in development. We've  
25 covered most of this. We have been there as an OE

1 engineering group. The cold testing in sub-50-degree  
2 Fahrenheit. Hot testing at Ford facilities in Arizona at  
3 120 degree. And then high-altitude testing in our own  
4 facilities in Denver. Same factory -- same as factory  
5 warranty. No impact on the Ford warranty. We've been  
6 tested on this where dealers have -- a fellow has arrived in  
7 a dealership and said, "I've got a propane truck here," and  
8 the guy says, "We don't work on that. We don't know  
9 anything about propane." We convinced -- we calmed them  
10 down and said, "No, plug your diagnostics in, and let's find  
11 out what's wrong here." It was a Ford problem, certainly  
12 not a -- not a Roush or a propane problem.

13 Economical and cost efficient. Well, it says 3000  
14 public filling stations. There is more than 10,000. This  
15 is an easily -- I'm going to let Curtis get into this part  
16 of it. Incentives. I think we're all aware of what the  
17 incentives are, and I don't need to go into detail on that.  
18 Product overview. The F-150 has been available. It was  
19 done in '07 and a half. '08, we did not do further years  
20 because it would have required another million bucks and  
21 another year to get certified. We are ready, in California,  
22 to roll out. We believe we'll have -- our CARB  
23 certification is pending. EPA, we should have this week.  
24 We will be ready to deliver F-250 and F-350 pickups in  
25 October -- in mid October. We're confident that we'll be,

1 because the -- CARB has already given us the award on the  
2 certification on the F -- on the 5.4, and we've already --  
3 we've been obviously in discussions with them on where  
4 the -- where the next -- next certification stands on the  
5 F-250, F-350. This works with any of the -- any of the  
6 operating models that Ford offers.

7           Next is the E-150, 250, 350, and those will be  
8 available in February of 2010. We're actually starting to  
9 take orders now. We'll start delivery in February,  
10 passenger van, a cargo van. Under-bed tank, so you've got  
11 ultimate utilization of space with 330 miles range. And it  
12 starts -- the application fits the 2009 and newer models.  
13 Actually, had we done better research, we probably would  
14 have introduced the E series first. The demand on those is  
15 significant. We've got some real enthusiasm in the market.  
16 The E-550 Cutaway, your big shuttles, we're looking for  
17 delivery of that in about July or August of 2010. Under-bed  
18 tank, and we're working on the range on that. That's a  
19 new -- that's a 6.8 engine and -- for 2010.

20           We are focused, driven, and committed. Thank you  
21 very much.

22           MR. WARD: Thank you, Terry. I have a couple  
23 quick questions. I think you did go over, but maybe we  
24 just -- if you can -- you can probably answer these for me  
25 directly. And this is -- one was the Ford dealerships

1 around the country can diagnose and test your vehicles, but  
2 they can also service them. Is that --

3 MR. KARGES: That's correct.

4 MR. WARD: Okay. Because initially you said that,  
5 and then I think you followed up with --

6 MR. KARGES: As an example, because we don't have  
7 as many propane systems on the street right now, when we  
8 first started in our performance area, we were working with  
9 superchargers. And we have sold over 4000 superchargers now  
10 just to the dealers themselves. There was a concern about  
11 installation and the technology and then the serviceability  
12 after -- after installation. We have never had one issue on  
13 installation. We published a 50-page guidebook that goes  
14 along with it. Again, as an engineering company, one of the  
15 divisions that operates within Roush actually supports  
16 publishing of service manuals for the Ford garages. So we  
17 have a vast capability there as well. But the kind of  
18 manual that goes along with installation is significant.  
19 And if a dealer calls and they've got an issue with one of  
20 our trucks, we first have a tech on the line with them. If  
21 he has a question beyond that, we have two engineers that  
22 get on the phone with them. Beyond that we have a pretty  
23 substantial engineering team, and we have yet to have any  
24 issues with anyone that can't diagnose what's going on.

25 MR. WARD: So you have a way to resolve problems.

1 Probably won't happen. Probably won't have any problems  
2 with these vehicles, but should they arise, any dealership  
3 can be in contact with you.

4 MR. KARGES: We're real -- we pride ourselves in  
5 our warranty and customer service. With 15,000 high  
6 performance vehicles on the road, you can imagine the number  
7 of situations the drivers and owners get into, fortunately  
8 through no fault of our own. But in dealing with a vast  
9 array of Ford service folks and the knowledge of the service  
10 people that Roush is in the engineering business, and they  
11 can call us and get answers today. We really are the pride  
12 of the industry on customer service and warranty.

13 MR. WARD: You mentioned the F-250, F-350 pickup  
14 trucks. Available next month; right?

15 MR. KARGES: Next month.

16 MR. WARD: October?

17 MR. KARGES: Mid -- mid October. We believe --  
18 we've been told CARB is pending. They have the document  
19 complete from the original paperwork and that they're going  
20 to use that. So in our estimation, given the time frames  
21 that usually coincide with that, we're looking at delivering  
22 vehicles in mid -- mid October.

23 MR. WARD: Okay. So you can roll -- roll out  
24 immediately then.

25 MR. KARGES: Yes.

1           MR. WARD: Okay. On the E-150, 250, 350, I agree  
2 that is a large market. And if you were to do it over  
3 again, you might have gone for that one first. But the 150,  
4 250, and 350, that's going to be available soon too?

5           MR. KARGES: February.

6           MR. WARD: February of next year?

7           MR. KARGES: February of 2010. Yeah.

8           MR. WARD: And the Cutaway, July-August 2010?

9           MR. KARGES: Yes.

10          MR. WARD: Okay. You made another statement,  
11 brown states and green states. And I think I understand  
12 what you mean.

13          MR. KARGES: Well, and as an example, in Nevada or  
14 Arizona, we're delivering F-250s now. So we're not  
15 requiring CARB certification.

16          MR. WARD: EPA certification for those.

17          MR. KARGES: Right.

18          MR. WARD: Okay. Great. Thank you very much.

19          MR. OLSON: Terry, I have a couple questions on --  
20 I'd like to see if you can provide some information, if not  
21 today, in the future, maybe through individual meeting, on  
22 the differential costs compared -- propane compared to  
23 gasoline or diesel for this -- your range of vehicles. And  
24 so that would be a piece of information that we would want  
25 to know to determine how much money we'd want to allocate as

1 a rebate type of approach. And also let you know that very  
2 shortly now we will be announcing that rebate program, and  
3 the propane conversions are candidates for that. Propane,  
4 either original equipment or conversions are going to be  
5 candidates for that. We have some money set aside and would  
6 like your assistance in how we market that.

7 MR. KARGES: We're actually in discussions with  
8 Mike Trujillo and are looking at how could we tie some kind  
9 of a clunker program into that as well with the companies,  
10 especially the smaller fleet guys, where could that go, so  
11 that there would be an incentive, one, to get the propane,  
12 but also to see if we can't get some other vehicles off the  
13 road.

14 MR. OLSON: Can you give us a frame of reference  
15 of numbers, of how many vehicles you see coming to  
16 California?

17 MR. KARGES: I'm a wild speculator. I'm the wrong  
18 one to ask. Our company's more conservative than I am, so  
19 I -- it's difficult to say. I -- there's a propane  
20 distributor up in Northern California that, on their own,  
21 are going to buy 26, and they've already got the orders in.  
22 So we're looking at -- we're working with another fleet that  
23 wants to build 500 trucks by December. You know, it's  
24 widely ranging right now, but I can see several thousand  
25 over the next couple years, and several thousand being a big

1 -- you know, from 5- to 10,000.

2           The big -- I'll tell you, the guys that are on  
3 this and looking at savings of up to \$30,000 to \$50,000 per  
4 vehicle are the guys running the airport shuttles. I mean,  
5 our calculators on their savings is significant.

6           MR. OLSON: Is any part of your manufacturing,  
7 assembly, occurring in California?

8           MR. KARGES: Not at the moment.

9           MR. OLSON: If there was --

10          MR. KARGES: Well, no, let me tell you about that  
11 because the -- actually, the Ford dealers have the option of  
12 doing the installs on these themselves with full factory  
13 warranty. So no, we build our performance vehicles. So in  
14 fact, probably -- we're working with a dealership in --  
15 actually, many of the dealerships want to do the installs  
16 themselves because of the profit incentive there on the  
17 labor.

18          MR. OLSON: Okay. Thanks a lot.

19          MS. BAROODY: Terry, I've got one WebEx question  
20 for you. I'll read it to you.

21          What specification propane fuel is used to certify  
22 the engines and/or determines the emissions reduction, HD 10  
23 or HD 5?

24          MR. KARGES: I believe it's 5.

25          MS. BAROODY: HD 5?



1 MR. KARGES: 5, yeah.

2 MS. BAROODY: Okay. Thank you.

3 Okay. Next up, I believe, Curtis Donaldson, Clean  
4 Fuel USA.

5 MR. DONALDSON: Thanks. Curtis Donaldson, from  
6 Clean Fuel USA, Georgetown, Texas. It's good to be here  
7 today. Thanks for allowing us the opportunity on behalf of  
8 our company and the propane industry to provide you an  
9 update. We do have some -- I think some exciting things  
10 that have occurred in the last 60 days relative to both  
11 vehicle platforms and some funding for infrastructure that  
12 will hopefully benefit California and a growing need for  
13 vehicles out here.

14 Just a quick bio. I'm going to discuss a few  
15 slides. What we'll -- what the rest of the world calls  
16 autogas, propane as a vehicle fuel, is the most widely used  
17 alternative fuel, totaling 13 million vehicles. This slide  
18 says 10. We just an update from the World Propane Gas  
19 Association updating that to 13 million.

20 I'm not going to read through these points. I  
21 just want to bring some other points beyond these. Just  
22 recently, Chevrolet announced that every vehicle option that  
23 they have in Europe will come with a propane option next  
24 year. And so globally we see an increase in growth in the  
25 propane vehicle market, especially on the light-duty side.

1 And again, you see a lot of these facts that are stated  
2 here. I do want to mention that in Australia, last year  
3 alone, they did over 125,000 conversions of vehicles in  
4 Australia. And I believe their usage utilization rate's  
5 right -- a little over 15 percent of all of their  
6 transportation fuel in Australia is propane.

7 And again, I give those examples as a model of  
8 what's going on in other places around the world and  
9 certainly actually transpired here in the '70s after the  
10 world oil embargo when we reached about 1.1 billion gallons  
11 in the United States up to about 1982. So strong  
12 utilization here in the past. Utilization globally leads me  
13 to believe that with the incentives and what we have  
14 occurring in the marketplace today, we can certainly achieve  
15 some of those goals again that we had in the '70s and early  
16 '80s as a transportation fuel.

17 We already know about a lot of these as  
18 advantages. They've been talked about. So I'll just run  
19 through that. These as well. Propane advantages. And  
20 again, what all the Clean Air Act policies define as an  
21 alternative fuel, again, those are some duplicate points.

22 About Clean Fuel USA, we're headquartered in  
23 Georgetown, Texas, with offices in Novi, Michigan. We just  
24 opened a facility there for engineering and product  
25 development. We also have offices in New Delhi, India, and

1 Buenos Aires, Argentina. In those two countries, we're  
2 installing stations, converting vehicles, and selling the  
3 fuel in more of a turnkey fashion. Established in 1993.  
4 We're also a manufacturer dispensers for propane. We're one  
5 of the manufacturer dispensers in the United States and the  
6 only one with a UL listing on a dispenser for propane. And  
7 they're manufactured in Georgetown, Texas.

8           We also either own or operate 34 sites currently;  
9 13 of those are in California. Those are operated by our  
10 partner, Delta Liquid Energy of San Luis Obispo. Many of  
11 their stations are more to the north of here but certainly  
12 headed this way.

13           We also developed a liquid propane fuel injection  
14 system. We're the ones that founded and brought the  
15 technology from Europe and have been perfecting it and  
16 improving it, and you'll see a better version that comes out  
17 in our 6-liter product. Again, we provide the whole  
18 solution, working with partners, and I'll get into that  
19 after I talk a little bit about the 6-liter.

20           Our LPI system is very simply designed. Take the  
21 fuel rails out, put the fuel rails in, run the fuel hoses  
22 back to a tank, affix the tank to the system. It's got  
23 superior performance because it is a liquid system and it's  
24 [inaudible] supported. I want to go into the emissions real  
25 quickly. Our 8.1, which was kind of our first launch

1 product two years ago, we were able to achieve both CARB  
2 and EPA. We were the first CARB-approved system for propane  
3 in many, many years with our 8.1 system. Well below -- this  
4 is what we certified it at -- our actual tests in the lab  
5 were much lower than this. And certainly our lab results  
6 right now on our 6-liter are much lower than this as well,  
7 so -- both certified EPA and CARB, zero particulate matter.  
8 I think it was .00006. It was truncated out to zero, so  
9 very minimal particulate matter. And then we don't have to  
10 have the expensive add-on items that some of the other fuels  
11 like diesel have.

12           So it just increases the cost competitiveness of  
13 propane in this market. Unfortunately, the 8.1's going  
14 away, as you all know. And it's also the engine that's  
15 currently powering the Blue Bird school bus, which has been  
16 quite successful in California. We've probably save 650  
17 buses this year, Blue Bird, and I would say clearly a third  
18 of those were in California. Between California and Texas,  
19 probably 75 percent of those buses between those two states.

20           And so a very powerful program. It's just kind of  
21 kicked off, according to the reports from A to Z, which is  
22 the local Blue Bird distributor here in California. You  
23 know, every program takes time, and to get that many buses  
24 sold in this short a period of time, they're very excited.  
25 They, for sure, are ready for your program. They really

1 feel like they can double those bus sales in the next --  
2 this year and then the years beyond. So the market is  
3 primed and ready, and certainly it's been a very well  
4 accepted product in the marketplace.

5           The economics, I always like to show this slide.  
6 This was the current fuel prices when I -- when I left  
7 Texas. Diesel was about \$2.40. Gasoline was a little  
8 higher than that [inaudible] this slide. It was right about  
9 \$2.40 as well. Propane was a buck-fifty, and then with the  
10 50 cents off, and this is an operating cost per mile slide  
11 that shows, at those current prices that you see on the  
12 slide, the operating cost per mile of 18 cents versus 36 for  
13 gasoline and 30 for diesel. And then derives a fuel  
14 savings, down below, of what you can achieve by using  
15 propane.

16           And at the end of the day, we all want clean air,  
17 but especially the private fleets we also have to make the  
18 economic case. And so I always like to point out that  
19 propane can certainly help you with the economic case.

20           I want to say one thing about the bus program,  
21 again, in Texas. We have a school district in Dallas,  
22 Dallas County Schools, that operates 600 of their 800 buses  
23 on propane and last year received a check of over \$500,000  
24 from the federal government in their 50 cents per gallon tax  
25 back. The important fact there is our school districts,

1 like school districts everywhere, are under a budget crunch  
2 and they're able to mitigate a lot of that loss by watching  
3 where they spend their money on fuel. And their  
4 transportation director said it sure was nice to walk down  
5 the hall and take a \$500,000 check down to the CEO -- the  
6 CFO of the Dallas County Schools. He says, "I'm usually  
7 asking him for money. I was able to give him some money  
8 back." So some clear advantages to having a budget crunch  
9 on the school buses.

10           Service and warranty support. We match the OEM.  
11 So depending on what that is, we'll match the OEM. On the  
12 school bus, we were asked to match Blue Bird's five-year  
13 warranty and we have. And so this is just a statement to  
14 say that we currently are at two years with unlimited  
15 mileage on the 8.1 because that's what they offered, and  
16 certainly we've offered a match of every single OEM product  
17 that we've been asked to do. We've got the technical  
18 training capabilities, the manuals, the CDs, everything that  
19 Roush has.

20           I think both us and Roush realize that when you go  
21 to the marketplace that you have to have the backup service  
22 and support. That's where we've failed in the past, quite  
23 frankly, in the '90s with our last go round of propane and  
24 the pickups. Customers would show up and say, "I want a  
25 pickup," and they'd say, well, the guy that can service

1 propane quit last week, and you've got a very frustrated  
2 customer. So we're trying to take cautionary steps this  
3 time, both us and Roush and others, to make sure that the  
4 customer's well-supported in the marketplace.

5           What's coming? In the fourth quarter of '09,  
6 first quarter of '10, our 6-liter will be ready. We got our  
7 test back from both EPA and CARB on the 5, and they're  
8 certainly waiting, just as many others are, on the  
9 administrative process. Of course, we'll achieve EPA before  
10 we'll get CARB, but we'll keep you posted on those  
11 developments. That's our latest timing based on our  
12 conversations with the regulatory compliance groups.

13           The Cutaway van, workhorse. Applications, those  
14 vehicles that you see there on the screen. Certainly the  
15 8.1 going away, it helps us to come right back in with the  
16 6-liter. It's GM's largest-selling engine that they have.  
17 Over 105,000 per year 6-liter engines are sold in this  
18 country. And by using your statistics, Peter, as the third  
19 largest user of fuel, I'm sure that quite a few of those  
20 105,000 6-liters will end up right here in California. So  
21 all candidates for propane.

22           Second quarter of '10, we'll have the 2500, 3500  
23 Chassis Cab application certainly tied into service vehicle,  
24 technical support vehicles. A lot of fleets already  
25 contacted us about this. This is the actual vehicle they

1 need to drive around, delivery. Delivery, but more  
2 importantly support in the field from phone companies like  
3 Verizon and others who have these vehicles out driving  
4 around all day.

5           And then the complete van and pickup truck  
6 cab-over applications will be ready in '10. I think our  
7 current projection is fourth quarter right now of '10. It  
8 could be third quarter, but we don't over promise and under  
9 deliver, so I think we're counting on fourth quarter on  
10 these applications.

11           Next, our dispenser technology. We'll go from our  
12 vehicles to our dispenser side. There you see what we  
13 currently offer from a dispenser standpoint. Looks just  
14 like gasoline, operates like gasoline. [Inaudible] a very  
15 seamless technology for the drivers of the fleets to fill  
16 up. The one furthest to your right, the Gilbarco style,  
17 that's featured at our Conoco station in Denver. It's a  
18 card reader on the face. You just swipe the card that says  
19 you've been trained. It's a Clean Fuel USA card. You swipe  
20 it, and then it says please enter your method of payment,  
21 and then you charge it on whatever fleet card your company  
22 uses, Conoco, Voyager, any of those. Again, trying to offer  
23 fleets a seamless program.

24           I do want to tell you quickly about a program that  
25 we've just received Department of Energy funding for. Our



1 partner's ConocoPhillips. We just received a grant, \$12.3  
2 million to put 188 stations across the country in 15 cities.  
3 Our approach here being similar to what our approach has  
4 been on the vehicle side. If you noted, on the 8.1, our  
5 focus was bobtails from our own industry in delivery fleets  
6 but also a market niche on the buses.

7           So our goal is to go and really dominate some of  
8 those market segments, which is exactly what we're doing in  
9 the 6-liter. We're coming out, going after the [inaudible]  
10 market, going after the delivery and technical support  
11 market, as well as the package delivery market. Once again,  
12 with this program we've selected 15 cities, with a very  
13 targeted approach to get those 15 cities and put in 8 to 10  
14 sites around the city to remove the barrier from a fleet  
15 manager's mind of where do I get the fuel. And this will  
16 certainly supplement the program that's already in  
17 California with Delta Liquid Energy as well as the other  
18 marketers.

19           Our partners are LPG fuel marketers, PERC as well,  
20 helping us with outreach and helping us drive the city  
21 plans. We're doing a lot of research right now, who the  
22 fleets are, where the fleets are, which ones have the  
23 vehicles that we have certification on, and then targeting  
24 those fleets. And then to know that we've got a package of  
25 8 to 10 units to put in, and then actually allowing the

1 fleets to tell us where they might want those stations  
2 located. And then certainly ConocoPhillips, we've got  
3 wholesale propane supply. So this time we come to the table  
4 with somebody that has retail space for wholesale supply, a  
5 producer, and so backs up any of the issues that somebody  
6 might say but what about supply. And certainly Conoco,  
7 through the Union76 brand, has a footprint -- has a  
8 footprint in California that we'll be coming to.

9           There's the grant, the information on it in blue.  
10 I want to just talk about the California piece of this.  
11 We've got 35 stations slated for California, 4 private  
12 sites, 3 at L.A. Unified and 1 at Anaheim Resorts. We've  
13 got 25 medium-duty trucks and 90 school buses that are all a  
14 part of our funding packet. And so a lot of the funds from  
15 our grant will be thrown into California through this.

16           Another part of our grant is to establish training  
17 and curriculum for mechanics through Texas State Technical  
18 College. They've got a series of about 37 other technical  
19 colleges around the country -- two of those are in  
20 California -- that they'll be working with. They'll develop  
21 the curriculum. It will be 70 percent web based, 30 percent  
22 on site where you come and do the last part hands on. But  
23 part of this plan is all encompassing to say we're going to  
24 take care of the infrastructure and make sure there are  
25 places to fill up. We're going to take care of curriculum

1 and training so mechanics are trained and so anybody can  
2 send a mechanic there. Ford will be able to send their  
3 mechanics there, GM will be able to send their mechanics  
4 there, any kind of mechanic shops will be able to. And so  
5 the spread from Texas State Technical College to outlying  
6 colleges in that curriculum package to ensure that you've  
7 got the backup support to continue and upgrade that  
8 training, so there are mechanics in the marketplaces to  
9 service and support these vehicles.

10           There's the cities and the phase. The phases  
11 really change. This is, in blue, the California cities that  
12 are part of our program -- our 15-city program. Sacramento,  
13 Los Angeles, and San Diego. I will tell you that some of  
14 the cities and the flow of those cities will be changing.  
15 Don't know yet. We're just doing our negotiations now with  
16 the DOE, but certainly those are the three cities in  
17 California that are part of our grant.

18           And there's our partners. Quickly, us,  
19 ConocoPhillips, TSTC, and then initially, from the service  
20 partnership standpoint, Rush Enterprises, the largest  
21 medium-duty truck. They've got locations in California, and  
22 they've been already servicing propane. They've already got  
23 set up to service propane, and they'll be our partner in  
24 many of these cities as we launch, as an initial partner to  
25 handle the service and the installation support.

1           That's just a recap of our California development  
2 piece, 35 stations. There's already 13 existing stations,  
3 so that would put us up to 48. And again, three service  
4 centers, that's another part of our grant. Part of our  
5 grant is to establish a service center in each city. And so  
6 they will be partner operated or company operated service  
7 center that will kind of be the center of expertise in that  
8 city for propane. So if a GM dealership sells a 6-liter and  
9 GM chooses not to offer service, the service is available at  
10 the service center. Same thing with Roush and the Ford  
11 pickup. If the Ford dealership says, hey, we don't want to  
12 mess with service, there will be a service center there  
13 that's focused on install and conversion kits, and then  
14 servicing all the vehicles in that city that are operating  
15 on propane. And that is part of our grant, so there will be  
16 a service center, or a center of expertise, in each  
17 location.

18           And then we've got dollars in the grant for Clean  
19 Fuel USA, Conoco, PERC, and the Western Propane Gas  
20 Association to educate and outreach activities in those  
21 markets. Again, 10 to 12 vehicle platforms in '09 to '10.  
22 That includes what we're bringing to the market along with  
23 Roush.

24           So I want to leave you with the fact that there's  
25 more vehicles coming, new vehicle platforms, so the

1 population can grow. There's going to be spaces, there's  
2 going to be service. Now we've got the 6-liter. We just  
3 signed an agreement with Collins Bus, so now you can get the  
4 small school bus too, the Type A. So you can order the Type  
5 C bus, now you can order the Type A, so school districts can  
6 have a complete offering to go to propane. We're working  
7 with Jim Moore and the folks at ESI to do -- to kind of  
8 duplicate what he'll tell you about this afternoon -- the  
9 7.6 that they're bringing to market in natural gas. And we  
10 hope to have that similar program with propane.

11           We're also looking at projects in the future. A  
12 port truck for a company called Capacity in Tyler, Texas,  
13 that is also owned by Collins Bus. A 6-liter hybrid that I  
14 can't say much about yet but we're already really working on  
15 with a company that already has the hybrid technology, so  
16 we're merging what we're doing with what they're doing on  
17 the customer now. I'll be able to talk more about that in  
18 the next three months. And then certainly we have to  
19 migrate from the 7.6 to the 9.3 on Navistar.

20           And then lastly, I'd just like to close with we  
21 really have a lot of momentum now. I think a lot of people  
22 looked at the money that flowed out of the ARRA funding.  
23 Propane got quite a bit of money. And I think that's -- I  
24 think that's recognition by DOE and others in this country  
25 that propane is the right-now fuel. The infrastructure's

1   there, it's mature. Pipelines, transport, bobtails. We  
2   can get propane anywhere. It's a liquid fuel, very easily  
3   transportable; 35,000 bobtails, 7000 miles of pipeline,  
4   10,000 transports. You know, it's just very mature from the  
5   distribution standpoint.

6               So, you know, I would like to partner. We already  
7   have been with the California Energy Commission. We  
8   appreciate the support in the past. And certainly I know  
9   you guys are working alongside of us, but I'd like to see  
10  support in the R&D area. We've really got the industry kind  
11  of polarized now around the engine fuel market for the first  
12  time. And with the incentives and the grant dollars, it's a  
13  great time, but to get more products that can burn the fuel  
14  is going to be a key.

15              And so any support dollars there, I know if we  
16  could keep dollars flexible with the new plan, so there's  
17  some flexibility. I don't think today we can nail down  
18  everything that's going to be -- that's going to need to be  
19  done in any state. And so I would encourage you to have  
20  some flexibility in that area or some flexible dollars  
21  [inaudible] related to what we can do in the R&D area to get  
22  more products on the street in California.

23              I also ask that you increase your current plan  
24  investment relative to support of the other fuels, propane  
25  with 2 million and the other fuels with what they're

1 receiving, recognizing that we haven't had many products.  
2 But I think today we've hopefully made the case that more  
3 are coming and remove a lot of the barriers with all the  
4 dollars that are going to be flowing into California for  
5 service centers for stations, et cetera, and then scale back  
6 after maybe the next 30 years.

7 But propane really is the right-now fuel. It can  
8 deliver results for you guys, I think, in a shorter period  
9 of time, and I know the school bus market and other markets,  
10 especially the short bus, will be very receptive to your  
11 buy-down program. And if we use it up quick enough, we can  
12 come back and get more so -- is there any questions?

13 MR. WARD: I do have a question. I'm sorry to  
14 hear the 8.1-liter engine has been discontinued. You know  
15 we wrote a letter on that --

16 MR. DONALDSON: Yeah.

17 MR. WARD: -- to the -- to General Motors to see  
18 if they could continue that. They've made that decision  
19 apparently now to --

20 MR. DONALDSON: First of all, I appreciate the  
21 letter. All the letters counted. And certainly the one  
22 from your staff counted. GM really struggled with that  
23 decision. They've done away with it. It's never over until  
24 it's over, so -- you know, but the word now is it's gone.  
25 But we're already hearing rumors that it might resurface

1 through a smaller manufacturer -- smaller volume  
2 manufacturer in Mexico. We don't know. It's still quiet,  
3 Peter, but -- for the moment.

4 Now, in advance of that, we made a deal between  
5 ourselves and Blue Bird to stockpile enough of the 8.1s for  
6 the next couple years as well as launch a successor engine  
7 program to be ready when those engines run out that we --  
8 that there's no gap, that we've got the successor engine in  
9 place and so there's no gap on the Blue Bird school bus.

10 MR. WARD: For California?

11 MR. DONALDSON: For California. Yes, sir.

12 MR. WARD: Great. I wanted to point out -- and  
13 maybe there's some confusion -- you didn't actually propose  
14 in our state for infrastructure because our Investment Plan  
15 did not cover infrastructure. Your plan went through Texas.

16 MR. DONALDSON: Right.

17 MR. WARD: And you were successful for that plan.

18 MR. DONALDSON: Right.

19 MR. WARD: But of your good graces, you're going  
20 to actually put some stations in California nevertheless.

21 MR. DONALDSON: Absolutely.

22 MR. WARD: Thank you so much.

23 MR. DONALDSON: Yes.

24 MR. OLSON: Curtis, I have a couple of comments  
25 and a couple of questions. Just to kind of verify on the



1 fuel cost, the fuel cost comparison, \$1.50 a gallon GGE  
2 comparison to the gasoline and diesel, that's a contract  
3 fleet price? It's not -- it's not a weekly barbecue propane  
4 price?

5 MR. DONALDSON: Absolutely. That's exactly right.  
6 I think there's a lot of confusion. Certainly we have  
7 people that go to the DOE website and see that price listed.  
8 And that's right, Tim. That's more of a retail bottle for a  
9 price. That is a fleet price. So that's the price that's  
10 at our dispensers in Texas currently because we only sell to  
11 fleets. We don't sell. And certainly I think, on a  
12 comparative basis, I attempted to -- I had to ask Terry, but  
13 I know the way it's priced at the Clean Fuel USA sites in  
14 California is also priced at the fleet price.

15 MR. OLSON: And what are the current -- is that a  
16 one-year contract or what -- how do you normally do that?

17 MR. DONALDSON: There's two things. There's two  
18 ways to go about it. And now, with Conoco aboard, giving us  
19 extra ability to hedge, there will be the ability to lock in  
20 on an annual basis. But some fleets still like to play the  
21 float. What's going to happen at Bellevue and they'll price  
22 it off of Bellevue. So some folks will actually play the  
23 float and then price will be based on a monthly Bellevue  
24 average. But there's flexibility, so we go to the fleets,  
25 they can buy at will at the island, they can lock in to a

1 Bellevue float, or we can lock in to an annual price.

2 MR. OLSON: And can you -- another topic here.

3 Can you estimate the difference in CARB certification cost  
4 versus other states and the U.S. EPA?

5 MR. DONALDSON: It's about double.

6 MR. OLSON: Double.

7 MR. DONALDSON: Both in cost and sometimes in  
8 time.

9 MR. WARD: Do you have a rough estimate for cost?

10 MR. DONALDSON: I can get back to you with that.  
11 If I said something today, I'm sure it would be off. But  
12 one phone call and I can tell you what that is.

13 MR. OLSON: That's helpful. Another -- another  
14 comment is, as part of our specifications here coming up, we  
15 are proposing what we're calling kind of cost share on  
16 prototype demonstration development engine trucks. But  
17 that's not meant to be a deployment type of rebate. It's  
18 meant to be contracts and agreements with manufacturers, new  
19 lines, new technology. This will be kind of focused on  
20 non-petroleum, what we call non-petroleum fuel platform. We  
21 would like to see some combination with hybrid electric or  
22 electric technology. So --

23 MR. DONALDSON: Okay. Good.

24 MR. OLSON: -- if you're interested in that,  
25 that's [inaudible]. So two different kinds of vehicle

1 programs. One, rebates for deployment, and then another  
2 for what we're calling -- associated with electric drive,  
3 non-petroleum platform. We consider propane to be a  
4 non-petroleum platform.

5 MR. WARD: I was going to ask you, the CO2  
6 reduction that you cited, ten percent, I think it's in a  
7 little bit of conflict with what Lesley presented, but I'm  
8 not sure. Maybe Lesley was speaking of the carbon intensity  
9 of the fuel. Maybe that was the difference -- 18. Oh,  
10 Terry, I guess. It was 18 percent. And that's -- I think  
11 it was more 18 percent -- of what we had found closer to  
12 that, closer to the 20.

13 MR. DONALDSON: I grabbed that off [inaudible] so  
14 I think maybe if they --

15 MR. WARD: It wasn't an Energy Commission sourced  
16 site, Mr. Donaldson?

17 MR. DONALDSON: It was not. I should have grabbed  
18 your numbers.

19 MR. WARD: Yeah, might be.

20 MR. DONALDSON: And probably more up to date too.

21 MR. WARD: There we go. Thank you.

22 MS. BAROODY: Thank you.

23 Okay. Next up, County of Los Angeles Department  
24 of Public Works, Rick Teebay. Come on up.

25 MR. TEEBAY: Good morning. Thank you very much

1 for allowing me to speak to you today. I appreciate the  
2 opportunity. The County strongly supports a multi-fuel  
3 approach that includes CNG, propane, as well as electric,  
4 E85, biofuels, and biomethane fuels. So we are very much  
5 fuel neutral, but I'm speaking today on behalf of propane.  
6 I've been heavily involved in the deployment of a number of  
7 propane vehicles, and I hope to sway you with some of the --  
8 some of what we've done.

9           Okay. I wanted to start by reviewing some of  
10 what -- what Peter had spoken of earlier this morning.  
11 Transportation represents about 38 percent of California's  
12 greenhouse gas emissions. And of that, about 75 percent --  
13 or 30 percent of the state's greenhouse gas emissions are  
14 from light-duty vehicles, so vans and light trucks. And  
15 they -- much of the rest, the other -- another 70 percent  
16 comes from heavy-duty trucks, medium-duty trucks, and  
17 construction equipment.

18           The legislative drivers in California are AB 1493,  
19 which is the Pavley Bill. It reduces vehicle CO2 emissions.  
20 Really pushes technology. AB 32, of course, is the  
21 overarching driver. The governor's low carbon fuel  
22 standard. And finally, SB 375, which is going to require  
23 significant changes in how we design our communities.

24           So 1493 required that CARB establish some dramatic  
25 and cost effective emission standards for vehicles. The

1 auto manufacturers have challenged that, and they probably  
2 will. And like airbags, it is a -- it's a technology  
3 driving regulation. So by 2012, we're looking at a 22  
4 percent reduction. And by 2016, we're looking at a 30  
5 percent reduction, which translates into dramatic  
6 differences in our fuel economy. But on the upside, it's  
7 also going to -- we're going to see dramatic improvements in  
8 our greenhouse gas emission in terms of reaching that 2020  
9 target.

10 Most significantly for this presentation is  
11 probably the governor's low carbon fuel standard. And it  
12 really requires that we -- as a state-nation, that we  
13 dramatically reduce the greenhouse gases per mile -- or per  
14 gallon of fuel -- or gallon equivalent. And SB 375 means  
15 that we're going to have to redesign, to rethink how we  
16 design our communities.

17 So the question is: CNG or propane? But do we  
18 really ask gas or diesel? If you're in a hurry, you would  
19 automatically say gas and diesel, it depends on the  
20 application. I'm not sure on the stats course. So why not  
21 CNG and propane?

22 Propane has a lower carbon value than CNG, and  
23 through Class 5, which is through 19,500 pounds, propane  
24 conversions are less costly than CNG. Propane refueling  
25 structure is far less costly, and propane requires fewer

1 shop modifications. Fewer and much less costly. Propane  
2 is less costly than gasoline, diesel, and often CNG.  
3 Propane's price has been more stable, and the performance in  
4 mileage has been equal to that of gas and CNG engines.

5 This is a typical Cutaway. This is bid pricing,  
6 and I don't know if you can see that or not, but we went out  
7 to bid and we opened bids in May. And the state contract  
8 opened, I believe, in June -- CalTrans' state contract. And  
9 the way the -- I'm going to back up to this one.

10 When you write a contract, in order to make it  
11 available to other agencies, which is frequently a  
12 requirement when you're -- when you're buying a shuttle  
13 vehicle using federal money, you have to write it in such a  
14 way that other people can add or delete. So we're buying  
15 this and so we might want it as a gasoline. We might want  
16 it as an alt fuel. Somebody else might want it as a diesel.  
17 So they can piggyback or use our bid to purchase the same  
18 vehicle.

19 So in this bid, the base price of the vehicle is  
20 based on a gasoline vehicle. And you'll see that's in the  
21 low 60s to mid 60s. The cost -- the additional cost for a  
22 CNG vehicle is \$28,000, and the additional cost for a  
23 propane vehicle is \$18,000. So in other words, you would  
24 take the base price, let's say 65. If you buy a propane  
25 version, you're going to pay \$18,000 more. If you buy that

1 as CNG it will be \$28,000.

2           Okay. Refueling infrastructure. Recently they  
3 had a grand opening of a school bus yard in North Hollywood,  
4 and they installed a 15,000 gallon propane refueling tank.  
5 From the date that they city signed off on the design of  
6 that, it was three months to the moment that it opened. The  
7 total cost was approximately \$130,000. And if you look at  
8 that document from your -- from your own report, the  
9 infrastructure costs for CNG are substantially higher.

10           And so my point is I look at this, and I'm  
11 thinking okay, CNG gets \$43 million and propane gets \$2  
12 million, and if you look at Sempra Energy's facility in --  
13 near Ensenada, about ten percent of the LNG, when they  
14 regasify it when it comes off, comes off as very high grade  
15 propane. Sempra owns San Diego Gas and Electric as well as  
16 the gas company. Sempra could fuel its service trucks for  
17 free using the propane from its LNG terminal. If you want  
18 to increase the use of alternative fuels, I think that's  
19 just a -- it's a no-brainer.

20           Okay. So my point is this. Please don't pick  
21 winners and losers. CNG for truck and buses over 20,000  
22 pounds. Under 20,000 pounds, let the market decide.  
23 Distribute the funds more equitably between the gaseous  
24 fuels or put all the funding in a single pot for both  
25 gaseous fuels and let the market decide. I believe that

1     there's a place for both CNG and propane.

2             Thank you very much.

3             Oh, I have one more thing I wanted to show that  
4     I've skipped past. Can you bring up that Excel spreadsheet.  
5     The City and County of San Francisco's environmental group  
6     has done a really wonderful calculator as part of its -- as  
7     part of -- and they did this as part of Clean Fuels. And  
8     what I did was I've put in some transit vehicles we have.  
9     And if we can -- let's see if I can scroll down here.  
10    Where's the mouse? Does this work?

11            MS. MAGANA: Do you want me to scroll down?

12            MR. TEEBAY: Yeah. Just if you can scroll down a  
13    little bit. So -- yeah. Up a little more so that we can  
14    see the difference. I don't know if this is going to show  
15    or not. Right in here there's a -- Column T is -- what that  
16    is, is that's actually the pounds of CO2 emissions. Yes,  
17    unfortunately, it's locked, which is both good and bad. But  
18    what I did was we know what our -- I put in some sample  
19    numbers just to see what our -- what our propane vehicles  
20    were.

21            And what I did was below that I plugged in the  
22    same -- the same gallons and the same prices for CNG just to  
23    see what the emissions difference would be in terms of their  
24    CO2. And one of things we're finding is that we're actually  
25    seeing our greenhouse gas emissions increase, and increase



1 significantly, as we expand service because people are  
2 becoming more transit dependent due to the economy.

3           So for us, what we're -- even though our  
4 greenhouse gas emissions are increasing for our fleet, what  
5 we're seeing is that they're increasing less than they would  
6 if we -- if we had used different fuel. So in the South  
7 Coast, everything has to be alternative fuel, so what I did  
8 was I plugged in both the CNG numbers and the -- and the  
9 propane numbers. And if you look -- can we -- can we scroll  
10 down just a little bit. This is not the most -- I need a --  
11 I need a screen about 28 inches wide.

12           But actually what it demonstrates, if you look at  
13 that, and I'll read this with you, you can -- you can look  
14 at the detail. But actually the CNG actually has a larger  
15 carbon footprint for a similar amount of fuel than the  
16 propane. So on that note, I will -- I will end. And if you  
17 have any questions, I'd be more than happy to answer them.

18           MR. WARD: Thank you, Rick. A quick comment. On  
19 the emissions side of this, I'm not quite sure -- this is  
20 information that's on a calculator.

21           MR. TEEBAY: Well, they used -- they used the  
22 Climate Registry's numbers. And I -- I had issue with --  
23 with them on some of what they used. And they -- they  
24 referred me to this, and I found the emissions in the  
25 registry that they used. And so I knew that their numbers

1 were at least, in terms of this document, they were  
2 accurate. They may not be quite the same as yours, but they  
3 are -- but they were true to this.

4 MR. WARD: Well, I do think, though, that in other  
5 response -- but we are -- we are going to use a 14-cycle  
6 assessment, and the information in the modeling of the Air  
7 Resources Board that's truly the source that's going to be  
8 covering our program. And that's established by regulation.  
9 That's the statute that's required. And, of course, all the  
10 alternative fuels are better than the petroleum based one.  
11 I'll agree to that, and I think we'll maybe leave it at that  
12 because we're certainly not picking winners. I don't feel  
13 we are.

14 MR. TEEBAY: No.

15 MR. WARD: And we don't anticipate we will in the  
16 future.

17 MR. TEEBAY: No, I understand.

18 MR. WARD: But thank you for your points.

19 MR. TEEBAY: I think the point was is that -- and  
20 if you look at it from a business point of view, the  
21 business -- the business point of view is that when the  
22 numbers come in, it really makes you look again at propane.  
23 And it makes you realize that this is a very viable option.

24 On top of that, there were two questions I wanted  
25 to touch on. One is the installers are two large

1 distributors, one in Fresno and one in Chino. And both of  
2 them have established conversion shops because they see this  
3 is a growing market. So the work is being done here.

4           The second thing is on pricing, the retail  
5 pricing. We get our -- we get statements. We require our  
6 contractors to provide us with fuel statements when they  
7 provide their invoices. And they like to get paid, so they  
8 provide their -- their -- what we ask of them. And they  
9 tell us how much fuel they used and what they paid. And  
10 typically, for the people that we see on a -- what I would  
11 call a retail basis, they are paying in the low \$1.70s  
12 currently for propane. And the people who are getting the  
13 50 cent per gallon credit are down under a dollar. So  
14 they're receiving it in bulk and distributing it.

15           MR. WARD: Those prices probably would not be  
16 evident in a retail atmosphere --

17           MR. TEEBAY: No.

18           MR. WARD: -- for the propane pricing.

19           MR. TEEBAY: No.

20           MR. WARD: Neither possibly for natural gas, so  
21 questions we've received over the WebEx could take that  
22 into -- into account, because you're not necessarily going  
23 to be able to determine those pricing. The pricing that we  
24 are discussing does not have available retail sale.

25           MR. TEEBAY: No. And the pricing -- and to get

1 the 50 cent per gallon, you'd have to purchase the fuel in  
2 bulk and dispense it yourself. Otherwise you're not  
3 eligible for the 50 cent per gallon credit. So if you're  
4 wet-hosing or if you are pulling into a retail pump, you're  
5 not going to see that.

6 MR. WARD: Great. Thanks for pointing that out.  
7 Appreciate it.

8 MS. BAROODY: Thank you.

9 Okay. I think we'll take a short break right now.  
10 Let's take ten minutes, and then we'll come back and have  
11 the light-duty natural gas vehicles. Thank you.

12 (Break taken.)

13 MR. WARD: Welcome back. Our first speaker on  
14 light duty will not be Elmer Hardy, and it will be Robert  
15 Vandenveld from Honda. Robert, please take it away.

16 MR. VANDENVELD: Okay. Thank you very much.

17 Thank you very much. Appreciate the opportunity  
18 to present to you today with respect to your Investment Plan  
19 information gathering for FY '10 and '11. I want to share  
20 with you Honda's CNG efforts and understand that from this  
21 meeting you wanted to gather insights about natural gas  
22 transportation, vehicle technology markets, infrastructure,  
23 consumer needs, and so forth. So that's the idea we have  
24 here to share with you.

25 So very briefly, we want to talk about why is

1 Honda interested in CNG, talk a little bit about our  
2 natural gas vehicle and our marketing in California to  
3 fleets and consumers. You know, the real reason we're here  
4 is primarily because of environmental reasons, air  
5 condition, climate change, energy sustainability, and those  
6 are kind of global issues but unique to -- not unique but  
7 especially to the United States, we're also worried about  
8 energy security.

9           And we think that a portfolio approach is needed.  
10 There's a variety of programs that we have going on,  
11 including improvements to internal combustion engines,  
12 lightweighting materials, clean diesel, hybrids, alternate  
13 fuels. I'm going to talk just a little bit about -- mostly  
14 about CNG.

15           When you look at the social values that I  
16 outlined -- air quality, greenhouse gas, energy  
17 sustainability, energy security -- and we also look at  
18 market availability issues like infrastructure, vehicle  
19 cost, and other kinds of -- on the marketing side there's  
20 numerous categories we could show. But to keep it simple,  
21 function and appeal here. When you look at all of these  
22 alternatives, there's no green all the way across. It's  
23 really a checkerboard situation.

24           CNG has a lot of merits for it -- going for it.  
25 And in terms of air quality, it's excellent. In terms of

1 greenhouse gas reduction, it's good. Energy  
2 sustainability, it's good to very good. Some people will  
3 not give it a very good because it is a fossil fuel, but  
4 there's some potential for biomethane, so it's a very rosy  
5 outlook for energy sustainability. For energy security,  
6 it's excellent. And on the marketability side, fair to good  
7 for infrastructure, especially in California. Vehicle cost  
8 is fair, and function appeal is good.

9           We think natural gas is a great choice for some of  
10 the reasons that I just mentioned. The recent Chesapeake  
11 discovery here in the U.S. increased domestic resources by  
12 100 years' supply of natural gas. We think that it's a  
13 strong domestic fuel and proven and safe with a lot of  
14 applicability.

15           When we look at greenhouse gas reductions, on the  
16 far left you see the average -- the average gasoline  
17 vehicle. And a comparable CNG vehicle would be about 27  
18 percent reduction. The Civic GX, because it is a little bit  
19 smaller than the average car, is actually a 44 percent  
20 reduction in greenhouse gas, a little bit above hybrid, but  
21 well below a comparable Civic.

22           That's greenhouse gas. I mentioned energy  
23 security. Here is air quality, and the Civic GX is to the  
24 far right. It is really an order of magnitude below  
25 gasoline vehicles in terms of [inaudible].

1           The Civic GX has achieved a lot of firsts for our  
2 company, and we're very proud of it. It's been a unique  
3 design of the -- of engine technology that we have. And in  
4 2010 there's a fully outfitted Civic with most of the  
5 features that customers want.

6           The Civic GX was introduced first in 1998, so  
7 we're actually on our fourth generation. The -- we're on  
8 our 12th model year going into 2010. It was targeted mostly  
9 with fleets. We really started focusing on retail markets  
10 with the 2006 model year in 2005. It's mass produced in  
11 Indiana, and I just want to point out there is a major  
12 component manufactured in California, which is the CNG tank.  
13 And for the fifth year in a row, it's been named the  
14 cleanest vehicle sold in the United States.

15           We have a pretty good network of dealer locations.  
16 In California, we have 129 -- I'm sorry, we have about 140  
17 retail outlets for Honda cars. But for the Civic GX we have  
18 42 dealers. So really, about a third of the dealers handle  
19 the Civic GX. And very good distribution of those dealers,  
20 especially where the fuel is.

21           Here's -- here's a look at that same time line of  
22 launch, along with sales, and sales have been growing. And  
23 I want to point out that our view of the incentives in  
24 California is that if we look at this baseline of sales,  
25 especially looking at consumers, and you can think of this

1 as about 150 to 200 sales a year, when the incentive is  
2 applied, it really increases that by 100 percent. And when  
3 gasoline prices increased above \$4.00 a gallon and there was  
4 a significant differential with natural gas, we had a little  
5 bit more than another 100 percent added. So the potential  
6 to really triple sales with the incentive and high fuel  
7 prices.

8           This is -- I'm not sure if it's current, but it  
9 shows a pretty good distribution of CNG stations in the  
10 Greater Los Angeles area. And when we plotted our retail  
11 consumers last year against this, you can see a very healthy  
12 distribution of retail consumers where there is good  
13 infrastructure. And we think it's very exciting, and it's  
14 given us a lot of insight on how to develop infrastructure  
15 for even advanced technology like fuel cell. So here's the  
16 stations plotted there.

17           And with respect to, I think, the kind of fact  
18 finding that you're interested in, from our viewpoint, the  
19 opportunities for increasing light-duty CNG sales and  
20 utilization of the fuel, certainly infrastructure -- I think  
21 the infrastructure providers like the heavy duty. There's a  
22 lot more fuel being consumed. But it's very important for  
23 retail sales, where the volume is for us, that  
24 infrastructure be oriented a lot more towards -- towards  
25 typical retail sales like, you know, convenient access



1 visible from streets, well lit, 24/7 access, that kind of  
2 thing.

3           And I think we're getting there. I think there's  
4 a lot more improvement in this area than there was, say,  
5 five, ten years ago. The incremental cost is a significant  
6 barrier. We're \$6300 above a gasoline Civic and about \$1500  
7 above the hybrid Civic because we're an order of magnitude  
8 of sales lower than a hybrid Civic. And, of course,  
9 continued access to HOV lanes. We think that will  
10 strengthen the position of the GX when hybrids are excluded  
11 starting in January 2011. We think that will be an  
12 additional incentive.

13           And that's it. Happy to answer any questions.

14           MR. WARD: Thank you, Robert. I do have some  
15 questions. Of course, we've known the Honda GX for many  
16 years. It's been a very big success in the market,  
17 obviously. Do you expand -- do you plan to expand that to  
18 any of your other models -- technology to that, because  
19 there could be even a wider application?

20           MR. VANDENVELD: Yeah. I think our struggle with  
21 that is really how much would be incremental versus how much  
22 is just dividing the market that we have. So we certainly  
23 there would be incremental sales, but additional costs of  
24 having it apply to multiple models doesn't help with the  
25 volume targets that are required to get costs down.

1           MR. WARD: I also note that you didn't mention  
2 home fuel. You've had an association with a home fueling  
3 device in the past.

4           MR. VANDENVELD: Yeah. The fuel maker technology  
5 was bought by a company that has a relationship with Newco,  
6 and I think they're going to be talking a little bit later.  
7 So maybe they can speak to that. Certainly we think that  
8 that's been a strong enabler for sales, even though we don't  
9 have a lot of one-to-one sales. That is to say we don't  
10 sell a retail car because of the home refueling  
11 availability. It certainly adds to the consideration and  
12 the comfort level. So I can't really say much about where  
13 that is today.

14          MR. WARD: It does remove the trepidation that  
15 some have in purchasing a dedicated natural gas vehicle. Of  
16 course, being in Southern California here, one of the most  
17 widespread networks for natural gas retail refueling, so  
18 that obviously is the market you've identified and are  
19 pursuing.

20          MR. VANDENVELD: Correct.

21          MR. WARD: I'm just curious. I know there was  
22 another manufacturer that, for about 15 minutes, mentioned  
23 that they may be doing a CNG hybrid. I don't think they're  
24 talking about that any longer, but you folks are leading in  
25 both of those areas, and I'm wondering if that can be merged

1 in any of your future technology efforts.

2 MR. VANDENVELD: Well, I think that that is -- I  
3 think if it is a potential solution, it is much further down  
4 the road. So when you look at the greenhouse gas targets of  
5 2050, where we have to get to, you know, 80 percent  
6 reduction from 1990 levels by 2050, you're looking at very  
7 radical technologies. And -- and though just -- when you  
8 get to those levels, I think you can consider things like  
9 hybrid CNG or hybrid diesel and there would be some  
10 opportunity. But at this point, you're looking at packaging  
11 challenges and -- and additional costs that -- that really  
12 don't help you with the goal of increasing volumes today.  
13 So I think -- I think that's kind of where it's at.

14 MR. WARD: Also, can you tell us about how many  
15 natural gas GXs you sell each year?

16 MR. VANDENVELD: In this slide here, last year we  
17 sold about 1600. And I can't say that we are -- this year  
18 has obviously been disruptive in many respects.

19 MR. WARD: Nationwide?

20 MR. VANDENVELD: Yeah, this is nationwide. I  
21 think for California, probably close to half of that or more  
22 like 40 percent.

23 MR. WARD: Given the other incentives available,  
24 probably not for other states, but for California, what  
25 would be the remaining differential as you see it

1 roughly -- and I'm not going to hold you to it, but that  
2 could potentially see a home for California incentive rebate  
3 money?

4 MR. VANDENVELD: I'm sorry.

5 MR. WARD: What would be the remaining  
6 differential after federal and any other incentives are  
7 taken on the purchase of these vehicles that California  
8 equipment could potentially fill?

9 MR. VANDENVELD: I think we would view that  
10 differential right now as about \$6000. Now, there are  
11 federal tax incentives, but they're less persuasive on the  
12 showroom floor. So we're -- we think that we had a lot of  
13 success with the ARB program which ended in May and that was  
14 about \$3000. So we've been talking to Mike Trujillo about  
15 that kind of level for the 09-10 fiscal year and that's, I  
16 think, something we would like to see continue.

17 MR. WARD: The federal tax incentive, do you  
18 recall what that amount is?

19 MR. VANDENVELD: You know, I don't off the top of  
20 my head.

21 MR. WARD: We can get that.

22 MR. VANDENVELD: I could certainly send it to you.

23 MR. WARD: Because you know what we're about.  
24 We're trying to fill the gap and not overfill the gap.

25 MR. VANDENVELD: Right. You're not overfilling.

1           MR. WARD: Okay. Thanks. Right. Yeah, because  
2 there's always the potential that more vehicles could be  
3 produced.

4           MR. VANDENVELD: Right.

5           MR. WARD: And we want to make sure that we  
6 utilize our funding on a wider basis.

7           MR. VANDENVELD: Right.

8           MR. OLSON: And it might be worth pointing out  
9 that I noticed that slide you had the retail and fleet  
10 sales. We've seen a lot of interest from local governments  
11 in this vehicle recently, and I don't know how much of that  
12 would be part of your fleet. But they're not taxed  
13 entities, so they don't get the tax credit.

14          MR. VANDENVELD: Right.

15          MR. OLSON: And that's part of the equation that  
16 we'd look at in terms of what that differential might be for  
17 non-taxed entities.

18          MR. VANDENVELD: Exactly.

19          MS. BARODY: Any other questions? No? Thanks,  
20 Robert --

21          MR. VANDENVELD: Okay. Thank you.

22          MS. BARODY: -- for your time.

23          Okay. Next up, I-M-P-C-O Technologies, Tim -- is  
24 it --

25          MR. WARD: IMPCO.

1 MS. BAROODY: Oh, IMPCO. IMPCO. This is Tim  
2 Standke.

3 MR. STANDKE: Standke.

4 MS. BAROODY: Okay. I got that right. Thanks.

5 MR. STANDKE: First off, thank you very much for  
6 letting me have some time to speak this morning. I do  
7 appreciate the opportunity.

8 And IMPCO, as you might know, is a company based  
9 out of Santa Ana, California. We've been around since 1958.  
10 We're really a global company. We recently merged with a  
11 company called BRC Gas Equipment from Italy, and we trade  
12 under the name Fuel System Solutions. So if you look at us  
13 as a company over the last -- the last few years, over the  
14 last 50 years, we've done pretty much everything in the  
15 alternative fuel business you can with LPG and CNG.

16 We have 1400 employees globally. Last year our  
17 revenues were \$383 million, and we have a presence in over  
18 70 countries worldwide, including Australia, Italy, Europe,  
19 everywhere. But we have lots of facilities, including Santa  
20 Ana and Sterling Heights, Michigan.

21 These are some of the companies that we do work  
22 with, some of them directly, some of them indirectly, some  
23 with OEM-type programs, and some with just what we call  
24 delayed OEM program where we have a factory that produces  
25 these alternative fuel vehicles.

1           To give you an idea of the magnitude what we do  
2 globally around the world, last year our group of companies  
3 converted over 800,000 vehicles. That equated to somewhere  
4 on the order of 250,000 tons of carbon -- reduced carbon and  
5 9 million barrels of oil displaced around the world. So we  
6 have a -- we have a record and vast experience in this  
7 particular area.

8           A little bit of history it says here on the -- but  
9 this is basically the fundamental parts of our system. We  
10 have a -- we have a gaseous controller, a fuel rail, we have  
11 a regulator, and if this slide will come out -- there we  
12 go -- and -- went too far -- wow, this takes a long time.  
13 This is the basics of our system, what we do on the  
14 front-end kit. And we developed this over the last few  
15 years, and we've deployed many, many systems.

16           In Italy alone, we have what we call delayed OEM  
17 programs where we take vehicles straight from -- not from  
18 the manufacturer directly but basically from the folks who  
19 are distributing before they get to the -- before they get  
20 to the dealerships, and they go through an assembly line  
21 where we package them. Right now, we do on the order of 25-  
22 or -- 25- or 30,000 vehicles a month that are putting these  
23 systems onto vehicles in Europe. We also have the same type  
24 of presence in Australia and many other countries, like  
25 Korea and Poland.

1           Alternative fuel -- okay, now, I was asked to  
2           talk  
3           a little bit about the market barriers because,  
4           interestingly enough, even though we've just launched again  
5           in the United States for the automotive market in February,  
6           we have not actually targeted the California market. And it  
7           has a lot to do with CARB certifications and vehicle  
8           accessibility in the marketplace. And also because we just  
9           got started and are taking basically the easier -- easier  
10          routes to take to the EPA states versus CARB states. Being  
11          a California company, California is sort of where we'd  
12          really like to be. We want to have a presence here,  
13          definitely.

14                 But some of the market barriers that we see is  
15          that we look at the market in terms of who buys the vehicles  
16          and what sort of things. Perhaps, first off, I should  
17          mention that our system is bi-fuel systems and not dedicated  
18          systems. And the reason why they're bi-fuel systems instead  
19          of dedicated systems is because, as a general rule, around  
20          the globe, the common person buying a vehicle wants to have  
21          a bi-fuel vehicle to hedge themselves against any kind of  
22          infrastructure shortfalls.

23                 And it's ironic that even in places with very,  
24          very mature alternative fuel infrastructures, take, for  
25          example, in Australia, in Victoria or Northern Australia,



1 you'll find that almost every single gas station has an LPG  
2 pump. When I say almost, it's probably on the order of 90  
3 percent. So it's not like, you know, gee, do I have to plan  
4 my trip? You don't have to plan a trip. Still, the  
5 overwhelming majority, I mean into the 90 percentile, of the  
6 vehicles sold there are bi-fuel systems. Okay? Because  
7 they never know when they are going to go someplace where  
8 they may not have it. It's a comfort level for the common  
9 customer. It's also a reason that many businesses will buy  
10 bi-fuels, and I'll explain that in a minute.

11           We have three basic types of customers. We've got  
12 the ones that will buy a green vehicle despite their  
13 pocketbook. Okay? They want to do the right thing almost  
14 regardless. Most people will buy a green vehicle, all  
15 things being equal. In other words, if I don't lose out, I  
16 really want to contribute to the environment. You'll find  
17 that's the position that most people are in.

18           The other one is certainly green vehicle is  
19 compelling, they're on board. Now, in terms of the  
20 commercial side, we also have one other aspect of this. The  
21 other three were present, but also we have the mandated  
22 vehicles. So really in the commercial vehicle, on the  
23 government levels, there's the despite your pocketbook, all  
24 things being equal, financially compelling, but also the  
25 ones that are mandated. Those, of course, are another

1 market that we look at. And those are the considerations.

2           So what is the biggest [inaudible] a person should  
3 consider? Well, what are the barriers to them? This is  
4 what we find in most of the countries and even true in the  
5 United States. What if I can't get fuel? It's not a matter  
6 of is there fuel available. The fear of what if I can't get  
7 fuel. What if I run out of fuel? How am I going to get  
8 fuel? Will I have to be towed? Or can somebody bring me  
9 some fuel? Or can I get to the gas station somehow? Who  
10 can service my vehicle? Can it just be any dealership?

11           I noticed that the whole Roush program with the  
12 dedicated vehicle, that's fantastic that Ford dealerships  
13 can do that. I think that's impressive. We want to get to  
14 that stage here in the U.S., where everybody can be  
15 confident about where they can take their vehicle and get it  
16 serviced if there's any issues. Right now, when the  
17 infrastructure's fairly immature, it's a very big concern  
18 really for most people.

19           Will my vehicle have any resell value? A lot of  
20 the businesses we see around the world, the fleets don't  
21 usually drive the vehicles until they're in the ground. The  
22 average vehicle lasts about 15 years on the road. I know we  
23 just recently did the Cash for Clunkers type program where  
24 they're buying vehicles to try to reduce the -- you know,  
25 the emitting vehicles, but that was about a total, I think,

1 of a million vehicles out of 270 million vehicles in the  
2 U.S. Ten percent would be 27 million. It's not making a  
3 huge dent. So resale value -- I'm sorry, the existence of a  
4 vehicle will still be about 15 years. So we start looking  
5 at 2050. It's not very far away if you consider the rollout  
6 program, say, for an OEM system or anything that requires  
7 development and only on new vehicle distribution.

8 My point there is we need to get access to the  
9 older and existing vehicles. I'm not saying 10-,  
10 15-year-old vehicles. We need to get access to vehicles  
11 that are 2 and 3 years old, and not just a few. Not just  
12 the fleet trucks and vans. We need all the vehicles.  
13 That's where our biggest barrier is. So the other question  
14 I might ask is: Why do I have to buy a new vehicle? Why  
15 can't I do mine? And why is it so expensive? Expenses come  
16 from volume.

17 So why do we at IMPCO believe in the bi-fuel  
18 system? Why does it work globally for us, and why do we  
19 want to do that here in California as well? Because we  
20 don't have to worry about infrastructure as much. The  
21 people that buy the systems, they are contributing -- they  
22 actually paying more money for a vehicle that runs on  
23 propane or natural gas, but they want to ride on alternate  
24 fuels for a reason. Maybe it's because they get \$1.75 per  
25 gallon. Maybe it's because they want to be green. Maybe

1 because they're mandated. But any way you look at it, it's  
2 because they are compelled to do so.

3 Do I have to tow my vehicle or can I drive it on  
4 gasoline to get something fixed? Is it going to be a  
5 [inaudible] just because I run out of gas? Or can I -- can  
6 I consider when I bring it in for service instead of needing  
7 to do it now because it only runs on alternative fuels?  
8 These are all considerations that businesses have to have.  
9 They have to answer these questions. Does the car ever  
10 stop? Do I stop delivering? Do I stop my business just  
11 because I'm trying to be green? That's a risk he has to  
12 consider and a risk they hesitate to take.

13 Resale value. A lot of fleets will basically want  
14 to be able to sell their vehicle after they've had it for  
15 four to five years. And if they have a dedicated  
16 alternative fuel vehicle, it's only that they're hoping that  
17 there's a market for that vehicle when five years comes  
18 along. If it's a bi-fuel vehicle, they very well have at  
19 least the gasoline system running in the background to be  
20 able to have the resale value in case the bottom drops off.  
21 We've seen the market drop out on natural gas a couple of  
22 times now. Not as low as LPG. What would happen to all  
23 those people with all the vehicles? What do they do? They  
24 feel like they're stuck with something.

25 And, of course, the existing vehicles, the

1 retrofit market. I realize it's not one of the most, you  
2 know, exciting markets to be dealing in. It's not the --  
3 it's not the leading edge in high tech industry. But that's  
4 where most all of the vehicles are. And if you want to  
5 affect carbon emissions today and you want to be able to hit  
6 these things in short cycle, you've got to be able to get to  
7 those vehicles.

8           Like I said, one of the techniques we try to do  
9 that is the Cash for Clunkers. Let's try to pull some of  
10 those out so we can get some good vehicles out there. But  
11 how many are we really getting to, you know? And the  
12 regular consumer, especially during hard times, what are the  
13 chances they're going to buy new vehicles? And the other  
14 problem we have is cost effectiveness. High volume  
15 manufacturing requires -- is required to bring the cost  
16 down.

17           We heard some of the costs of the systems out here  
18 today. They're on the order of \$10,000, \$15,000, \$20,000 to  
19 do a conversion. The systems in Italy that we sell are on  
20 the order of \$2000 for a full system to run on natural gas.  
21 LPG is cheaper. Why? Because of the volumes. Because we  
22 are doing 15- to 20,000 a month. We get to that level here  
23 in the U.S. and California, everybody will be able to get to  
24 them. It becomes -- it becomes cost effective.

25           So people operate on alternative fuels because it

1 makes sense. They want to do the right thing, but it still  
2 has to make sense to them. And that includes businesses.  
3 So we feel that the bi-fuel system -- and we do plan on  
4 working on CARB certs and bringing it to the market to help  
5 this industry and keep going -- but we believe that it's a  
6 proper gap between infrastructure and vehicles. If you  
7 don't have a strong infrastructure, buying bi-fuel vehicles  
8 and using them on alternative fuels grows an infrastructure.

9 I'll give you an example of what we've seen  
10 abroad. In Australia, I was there in 1999. Probably one  
11 in -- one in four, maybe one in five, gasoline stations had  
12 an LPG pump. After we had gone through a number of  
13 difficulties, the government decided that they wanted to go  
14 green. They wanted to run LPG. So they -- they decided  
15 that they would turn their fleets green. Of course, the  
16 only thing available on the market was bi-fuel. They  
17 converted all their fleets to bi-fuel, and they ran them for  
18 a year. And they thought we're green, everything's good.  
19 When they went back and looked at the numbers, none of their  
20 drivers drove on LPG. So they didn't accomplish their  
21 goals.

22 The immediate thought was the problem is that  
23 we're using bi-fuel, that we have to force people to use  
24 alternative fuel. But that's only because the people  
25 driving didn't have any reason to run on alternative fuels.

1 They had the credit card from the government. But if the  
2 person has incentive to do it, they do drive on it. And  
3 that's what drives the market. So fueling station guy says  
4 how come I'm using gasoline purchases because all the  
5 bi-fuel customers went to another gas station that has both  
6 pumps. So they go out and they get a pump. They put in an  
7 LPG pump, and now they get that business back. The  
8 government wasn't involved except maybe low-interest loans  
9 or something like that. But the infrastructure doubled just  
10 because bi-fuel systems were there.

11           The guy down the street now lost some of his  
12 gasoline business because the bi-fuel guys are going to the  
13 gas stations with both pumps. So he puts in a pump. So  
14 today, like I said, 95 percent of them have LPG. And it  
15 wasn't because the government's paying for them. Because it  
16 made sense.

17           So federal grants and loans offset costs. This is  
18 a very important thing to consider. When you have subsidies  
19 and you're trying to encourage alternative fuels, the  
20 subsidies will make specifications financially feasible. So  
21 companies like IMPCO and all kinds of companies, we can go  
22 and we can certify vehicles, especially if the government  
23 says, hey, we'll help you pay for them so that you can get  
24 them on the market. But human resources and equipment are  
25 also very high cost for certification. It's not like, you

1 know, the more money you get the more certs we do. It  
2 means the more people we have to have doing the  
3 certification. And the more people we have doing the  
4 certification, bigger crew, more equipment, bigger  
5 facilities, sounds like jobs and equipment, that sounds  
6 good. But you start getting into grant and loans for  
7 overhead on top of it, and the one important part about  
8 subsidies and loans -- I'm sorry, subsidies and incentives  
9 are they should kick start a company and help that business  
10 go to make things happen sooner, not create a financial  
11 dependency. You don't want to create a business that's  
12 dependent on government subsidy for subsistence. You need  
13 to make sure those incentives are targeted effectively.

14           So what they don't offset, unfortunately, is time.  
15 And it's more time than the cost of certification that  
16 really causes a problem. I'll give you an example. Apart  
17 from companies that have access to OEM vehicles prior to  
18 release, we get one basic year to do the entire program.  
19 That means I have to get -- find the vehicle off the lot. I  
20 have to do all my engineering work. Then I have to take up  
21 to six months certifying it. And when I have, oh, three or  
22 four months left, to sell it before the next model comes  
23 out.

24           So time becomes critical. Now my equipment has to  
25 multiply and my staff has to multiply. Certification for



1 CARB can take up to six months. If we get good at it, we  
2 might bring that down to four. A careful, modest selection  
3 is required.

4 That means that all the companies have to pick --  
5 there are very few models and makes that justify the highest  
6 volumes to get the best return, so you can't get to the  
7 common people. That's why it's always fleets. That's why  
8 it's always F-150s, 6-liter trucks, vans. You don't see  
9 very many passenger cars. What Honda did is extremely  
10 noble. I mean they're the ones saying: What about the  
11 people that want to drive them? And they went after that.  
12 It's great. It's noble.

13 In fact, we bought Fuel Maker assets. Part of the  
14 reason, we believe in that. We think that's how we can help  
15 the market and everybody else get there. With the way the  
16 certification process has worked, you have to think it  
17 through very carefully before we implement.

18 So what you have is low sales volume, high cost  
19 components. And there's really no way around it. The  
20 more -- the more proliferation you have, the more market  
21 competition you have, the lower the costs are. If we had  
22 more competitors out there, our costs would go down just  
23 because -- to compete in the market, let alone the fact that  
24 we want to produce volume sales.

25 Okay. So short term for dedicated vehicles. We

1 believe that there is a very good one right now. In fact,  
2 the most compelling argument in the U.S. and California  
3 right now is dedicated vehicles, and this is because the  
4 targets for the certification processes are fleets with  
5 constrained routes. And those are ideal for dedicated  
6 vehicles. The more infrastructure we build, the more  
7 [inaudible].

8           The other part of the market is home refueling.  
9 These are the people that want to buy green despite the  
10 pocketbook. Because between buying the up-cost of the  
11 vehicle and buying a home refueling unit, they're really --  
12 they're really on a limb. And it really helps to have the  
13 programs that help incentivize these people so that they can  
14 set a good example. But in the end, it's the people that  
15 want to set an example that buy it. And, of course,  
16 mandated fleets.

17           The market drivers primarily are infrastructure,  
18 mandates, fuel prices, incentives, and environmentally  
19 conscious people. This is infrastructure constraint.

20           Bi-fuel systems, we see that unconstrained route  
21 fleets and general consumers are the marketplace for that.  
22 These people buy green despite the pocketbook, but they  
23 don't have to take the extra burden of home refueling if  
24 they don't need to. And so, as you can see, there's much  
25 more accessibility to the marketplace for bi-fuel. But

1 there's still constraint, the certification requirements.

2           The primary market drivers here are [inaudible]  
3 infrastructure, fuel prices, environment, and of course,  
4 these are unconstrained infrastructure issues.

5           Okay. Now, European manufacture influence is  
6 another topic that they're asking me to discuss. The  
7 primary European market is bi-fuel despite the maturity of  
8 the -- of the fueling infrastructure. The people drive on  
9 alternative fuels because it costs less. Okay. They want  
10 to get a little hedge. Some of them, European manufacturers  
11 will be bringing in vehicles to the U.S. that have small  
12 pony tanks for gasoline. They developed these not because  
13 they want to enter the U.S. They've developed these for the  
14 European market where the primary driving is done on  
15 alternative fuels but secondary.

16           So I almost want to say we shouldn't say it's an  
17 alternative fuel. We should make it the primary fuel and  
18 then gasoline the alternative to help them get through.  
19 Know what I mean? That's kind of the way I'd like it to be.  
20 And it would be nice if we could have a big campaign that  
21 way, but that's another story, I suppose.

22           The one thing about it is, however, the European  
23 manufacturers coming in with their equipment here -- I'm  
24 referring to OEMs mostly -- not necessarily the aftermarket  
25 that's -- will drive system prices down. It would be a good

1 thing for the economy. It would be a good thing for the  
2 state. Dependent upon fuel pricing for success, however.  
3 They need to make sure there's a price differential or it's  
4 not going to work.

5 That's what we're seeing right now. The price of  
6 gasoline's going up, and prices of alternative fuels seem to  
7 be holding down. And as long as that sort of market stays,  
8 then you can let the market drive all these things. But  
9 we've seen before where the price of alternative fuels  
10 becomes just as expensive to gasoline, and the whole market  
11 drops out.

12 Market future of [inaudible] light-duty vehicles  
13 [inaudible]. Remember, vehicles have an active life of  
14 about 15 years. So the vehicles rolling off the line today  
15 are still going to be here 15 years down the road, being  
16 driven by people that can't afford newer cars. They can't  
17 convert. And with the vehicles you see on the road, they're  
18 probably the biggest polluters, and the ones we can't seem  
19 to access are exactly the ones we need to access.

20 So if you want to reduce greenhouse gases now, you  
21 have to access existing-type vehicles or have a mechanism  
22 that allows us to access existing vehicles. So I want to  
23 convert my vehicle. I want to be able to say yes to that  
24 customer. So we need to look at systemic solutions versus  
25 unit certification solutions. When I say systemic, I mean

1 we need to looking at how processes can guarantee the type  
2 of deployment versus just verifying an actual vehicle.  
3 That's my personal opinion, but I want it to be said.

4 Current ways prohibit access to most vehicles.  
5 That's an important message, I think. And costs, gasoline  
6 versus alternative vehicles, volume manufacturing definitely  
7 has its advantages, and it definitely drops the price down.  
8 I gave an example of how European system prices versus what  
9 the prices are here in the U.S. And it's an order of  
10 magnitude right now. [Inaudible] reduction is enormous here  
11 in the U.S. But it has to do with volume and market  
12 accessibility.

13 System costs in Europe -- I'm sorry -- and around  
14 the worldwide are way, way, way lower than they are here.  
15 And volume lost due to certification constraints is probably  
16 the biggest culprit. That and our tanks seem to be very  
17 spendy here, but I think that would come down with volume  
18 too just like everything else.

19 And I believe -- federal tax credits and dedicated  
20 vehicles, the only comment I can make about that is when you  
21 emphasize only dedicated vehicles and you emphasize trying  
22 to make an infrastructure at the same time, that's the same  
23 as trying to make the chicken and the egg at the same time.  
24 Okay? You don't have one trying to make the other or trying  
25 to go to the other. That's why we feel that the bi-fuel

1 systems make the biggest sense. They'll help you evolve  
2 the infrastructure while protecting minimal -- while  
3 leveraging the minimal infrastructure. It's a natural  
4 transition that happens really well around the world.

5 Does not encourage commerce to build  
6 infrastructure. It encourages government to support the  
7 infrastructure. Approaches consumer confidence from the  
8 steepest slope. We're talking about asking someone to take  
9 a leap of faith that the systems and the technologies are  
10 really, really good. You're not going to get left on the  
11 road anywhere. Yes, this is great even though it hasn't  
12 been around for 10 years or 15 years. We're talking about,  
13 you know, as a -- in fact, you can look 10, 15 years ago, a  
14 bad example to rely on as a reason for you to convert or to  
15 use alternative fuels.

16 And are we really taking the lessons learned by  
17 other countries and Europe really well? Have we really  
18 investigated and looked at what model makes them work? They  
19 definitely do incentives. That definitely drives it. But  
20 where does incentives lie, and how does that make the market  
21 work for itself? Have we asked ourselves that question?

22 Tax credits should expedite adoption, not create  
23 adoption. Again, this is my opinion, but the point is it  
24 should be able to stand on its own. The companies that are  
25 doing this, making conversions and providing these vehicles,

1 should be able to able to stand on their own. But if we do  
2 tax credits and incentives, it should make it happen faster  
3 and better. That should be the goal. So how do we best use  
4 tax dollars to achieve our goals?

5           Retrofit market. Can I convert my car? Sorry,  
6 sir, we don't have a cert. I just want you to know, last --  
7 last August, at IMPCO, we hired someone full time to answer  
8 the phone and basically to leave that message to people.  
9 Most of them are Californians. And they get very irate, and  
10 they also have the CNG now commercials, and they saw the  
11 Pickens Plan stuff, and they said great, I'm going to do  
12 this. They call up IMPCO and sorry, sir, we can't help you.  
13 Right? And that's just -- that is not -- that is not the  
14 answer an alternative fuels company wants to give to a  
15 customer that wants to buy something from them.

16           [Inaudible] competition affect the system costs,  
17 no doubt about it. That's where we need -- how do we  
18 achieve those goals with the companies we have and the  
19 incentives we have at our disposal? Have we thought through  
20 that? Is there -- is there a way? Infrastructure requires  
21 many consumers. You know, you want to justify that filling  
22 station, you've got to have enough people filling there.  
23 They've got to move enough fuel to pay back those loans and  
24 make sure that's effective.

25           And most of the cars are already on the road.

1 They're not the new ones coming out. I mean this year, I  
2 think it's only 12 and a half or 13 million vehicles are  
3 going to be new on the road. That's out of 270 million.  
4 Where are all those -- where are all the drivers? Where are  
5 the consumers?

6           Retrofit is key to environmental change now. It  
7 makes things happen faster. But we could also take a  
8 practical approach and look long term and get more new  
9 vehicle deployments. And there's nothing wrong with that.  
10 It's whether we want to accelerate or not. That's my point.

11           And the last slide, so you guys can relax after  
12 this. Now what? All things being equal, I'll help the  
13 environment. That is the No. 1 customer out there, we  
14 believe. We think that that's the biggest market, and  
15 that's where we can make the biggest impact on alternative  
16 fuels if we can just get to him. But I've got eat and pay  
17 my bills. You know? If they're worried about -- especially  
18 when times are hard -- can I afford to take the financial  
19 risk to go clean and green?

20           Use incentives to help commerce build  
21 infrastructure. Incentives can fast track my business, but  
22 my business must stand alone.

23           Exposing system vehicles to alternative fuels.  
24 How do I convert my vehicle? That's the big question that  
25 we have. We've had that question ringing off -- ringing off



1 the hook up until about December. It's slowed down. But  
2 it's starting to pick back up now because the fuel prices  
3 are going up and people are starting to become more aware.  
4 How do we answer that question and say yes?

5           So at IMPCO we are planning to address how to do  
6 CARB certs. We're going to try to make it more of a  
7 mechanism, try to work with them to come up with processes,  
8 but we might need a lot of help to show that things can be  
9 done properly. So in terms of allocating funding, some  
10 important funding I think can happen is showing ways where  
11 we cannot streamline the process or compromise any of the  
12 emissions or the emissions qualities or [inaudible], but how  
13 do we make it more methodical? How can we make it so that  
14 we don't have such dependence on these long, drawn-out  
15 testing programs just for burden of proof? Is there another  
16 way?

17           Thank you very much.

18           MS. BAROODY: Thank you, Tim. Do we have any  
19 questions for Tim?

20           MR. WARD: I do have a couple of questions. Can  
21 you give us a ballpark idea of how much the certification  
22 for your vehicles would cost if you had a bi-fuel? And  
23 you're not contemplating dedicated?

24           MR. STANDKE: We're obviously contemplating the  
25 dedicated systems. We're kind of reluctant in a way because

1 we feel that's a limited market, but it's the market in the  
2 U.S. So we are contemplating that. It's fair to say that  
3 right now I am personally budgeting half a million dollars  
4 to do certifications here in California. And that has to do  
5 with bi-fuel systems requiring both the gasoline side to be  
6 recertified as well as the alternative -- alternative system  
7 to be certified. But we're hoping to get some concessions  
8 to make it more equitable. And that is substantially --  
9 substantially higher than EPA certification.

10 MR. WARD: Right. You're reconfiguring your  
11 business at this point a bit. And so the plan is to go  
12 forward with certification because you've budgeted for it?

13 MR. STANDKE: I've budgeted for it, but we haven't  
14 confirmed our budget just yet. But yes.

15 MR. WARD: Okay. And how about on home fueling?

16 MR. STANDKE: We're very excited about the home  
17 fueling thing. We think it's a perfect fit. We think that  
18 it will help enable getting access to the market a little  
19 bit. There's two basic parts. Everybody's interested in  
20 the fuel that you hang in a garage. And we're doing  
21 everything we can to get that manufacturing up online,  
22 getting the -- getting the [inaudible] in place and being  
23 able to resume sales of those, as well as the -- the small  
24 and the midsize fleets where you have two or three vehicles'  
25 external one, which is also very, very good use to try to

1 build infrastructure. Absolutely. We're all behind that.

2 MR. WARD: And what's the approximate cost of your  
3 conversion kit that you may offer if you get it certified  
4 here in California for an older vehicle?

5 MR. STANDKE: It won't matter if it's an older  
6 vehicle or a new vehicle as far as we're concerned in the  
7 early stages, for the next few years, because we probably  
8 won't be doing the manufacturing process like I described to  
9 you. Therefore, it comes out about the same. In terms of  
10 cost targets, I try to maintain the cost target somewhere  
11 around \$2500 for the front-end system, which means just the  
12 components that control the engine and control the fuel  
13 regulation, those components you saw, plus the control,  
14 including certification, amortized cost [inaudible] volumes.  
15 Long breath.

16 However, tanks, the lines, and any other special  
17 things, we can't really -- we can't really speak to because  
18 we don't -- we don't enforce those just yet. That's not  
19 part of our system.

20 MR. WARD: A ballpark number for that?

21 MR. STANDKE: We know that in the field, on the  
22 EPA side, they go on the order of \$10,000, \$9000 per  
23 conversion for EPA systems.

24 MR. WARD: \$7500 would be the --

25 MR. STANDKE: I would like to see something like

1     that.   Yes.

2                 MR. WARD:   Thank you.

3                 MR. OLSON:   And can -- the last time I had looked  
4     into this, the home refueling was about \$5800.

5                 MR. STANDKE:  Right.  Right.  Yes.  And we're  
6     going to try to manufacture -- first, I can tell you what  
7     our plans are with that because at first we're going to  
8     replicate what they manufacture in Canada and do -- so the  
9     odds of reducing the cost in the beginning are low.  We'll  
10    then migrate to using our production processes and our  
11    systems, which will make -- hopefully take some cost out and  
12    improve quality.  And then in the last stage we'll start  
13    engineering costs out of it to reduce it to make it what we  
14    think is more of a market-appropriate pricing.

15                MR. OLSON:   So are you planning to move your  
16    manufacture here to California?

17                MR. STANDKE:  No.  They'll be manufactured in  
18    Italy where we can have vertically integrated manufacturing  
19    processes for it.

20                MR. OLSON:   And let me ask a question on -- is  
21    there a limit on the number of conversions that you can do?

22                MR. STANDKE:  I doubt there's any way the United  
23    States can possibly, in the short term, come anywhere near  
24    our manufacturing capacity.  Last year we -- I think we  
25    moved only a few hundred kits in the United States.  And as

1 I told you, in Italy -- in Italy alone, the manufacturing  
2 process is 15- to 20,000 -- I think 27,000 is what I was  
3 told last month -- in one month. The capacity far exceeds  
4 the demand here in the U.S.

5 MR. OLSON: So with the kits, are you doing that  
6 out of your facility or do you have partners that -- that do  
7 that conversion?

8 MR. STANDKE: We have installation partners. You  
9 saw Curtis Donaldson up here earlier. He's one of our  
10 distributors on installs, and so we're really happy to  
11 support his plan and deployment. And that's one of the  
12 reasons why we're going to try to get some CARB  
13 certification so that we can support him here in California  
14 as well. He's also looking at places like in Seattle and  
15 New York, and so to get to those markets we're trying to  
16 support him with CARB certs. But again, it's a difficult  
17 chore because of the return on investment is very hard to  
18 achieve. And it's the time factor that's more critical than  
19 the --

20 MR. OLSON: I may have lost track. I visited your  
21 plant a couple years ago. You do conversions for both  
22 propane and natural gas?

23 MR. STANDKE: That's correct.

24 MR. OLSON: And is there any kind of -- is there a  
25 difference in the numbers?

1           MR. STANDKE: Absolutely. In terms of -- you're  
2 talking globally or the U.S.?

3           MR. OLSON: I'm thinking U.S. but also California.

4           MR. STANDKE: California, we don't sell any  
5 systems right now in California. We don't have any CARB  
6 certs. So there's no --

7           MR. OLSON: For propane or natural gas?

8           MR. STANDKE: Neither.

9           MR. OLSON: So that's -- you're still working on  
10 that issue then.

11          MR. STANDKE: Yes.

12          MR. OLSON: That was very -- I don't know how to  
13 describe it -- volatile a couple years ago.

14          MR. STANDKE: Yeah. It's -- it's almost more of a  
15 position than anything else because from a business  
16 standpoint, IMPCO Technologies, we're not the kind of  
17 company that looks for subsidies or gets grants. And, you  
18 know, we just recently hired a grant writer just because we  
19 had the stimulus package, and everybody kept asking us, why  
20 don't you?

21               We're about making products and selling products,  
22 taking the margin from it, reinvesting into research and  
23 development, and then deploying into those marketplaces. We  
24 don't -- we don't have a mechanism so much to think about,  
25 gee, you know, you can get some stimulus money to get

1   yourself going. It doesn't make sense from our business  
2   model standpoint. It does make sense in the early stages of  
3   deploying in regions and countries that really want to get  
4   going.

5               So in terms of California, it doesn't -- it didn't  
6   pencil. It just plain doesn't pencil in California to stand  
7   alone with the type of market we have, which meanwhile, the  
8   incentives and things should be there. But we also have to  
9   consider how do we make commerce make it happen. That's  
10  where we come from. How do we make commerce make it happen?  
11  And that's what we'd like to see. And we want to have -- we  
12  want to have those discussions.

13              MR. OLSON: Maybe we should -- I think it would be  
14  helpful to us to have more -- more of your insight on the  
15  certification costs, what you call the -- get the methodical  
16  way of doing this.

17              MR. STANDKE: Right.

18              MR. OLSON: And it's -- we'd like to know more  
19  about that. That potentially is something that we can --  
20  could find under AB 118. It's always a difficult issue with  
21  our sister agency and how we approach that, but I think  
22  there's some openness to that that we're seeing.

23              MR. STANDKE: Okay.

24              MR. OLSON: And theoretically we could be a  
25  partner in facilitating that certification process, even

1    though it's another agency -- a sister agency -- that  
2    actually oversees that.

3               MR. STANDKE:   Well, most of the data and the  
4    research and things that we need done to be able to justify  
5    the reduction in CARB certification comes from the CEC.  
6    I've got, I think, a 50-page report right now that carves  
7    out a number of pieces of information that are little bits  
8    and pieces of CEC type research and development funds that  
9    starts painting a picture, and that's the picture I'd like  
10   to show to CARB and actually giving to you guys to show you  
11   what you've done.

12              And we actually have proven in many cases that a  
13   lot of the things that we do are not really necessary.  
14   Everybody kind of knows it should be true, but no one's  
15   really distilled it to show.   And that's what we're working  
16   on to try to do that.   So that's -- that's, I think, been  
17   our biggest project to give to CARB so that we can -- we're  
18   a California company.   We've been here since 1958.   But it  
19   really, really burns us -- it really burns us not to sell  
20   anything in California.   I mean we have people driving up to  
21   our door asking us, and we go, you know, sorry.   That's  
22   hard.

23              MR. OLSON:   Appreciate it.   Look forward to  
24   talking to you again.

25              MS. BAROODY:   Thanks, Tim.



1           MR. WARD: It burns us too that you're not  
2 selling anything in California.

3           MS. BAROODY: Thank you very much.

4           I know we're running about a half hour behind.  
5 However, we have a request from Cummins to present right  
6 before lunch. So we've allowed Dwight Hanson to come, and  
7 he says he can do this in six to ten minutes. No pressure.  
8 And after this I think we will break for lunch. That sounds  
9 good to me. And then we'll do public comment on -- on  
10 return from lunch.

11           Okay. Thanks.

12           MR. HANSON: Thank you for accommodating me. I  
13 really appreciate it. I'm Dwight Hanson. I handle the  
14 western United States for Cummins Westport, which is the  
15 natural gas arm of Cummins, and I'll just go through this  
16 real quickly and leave some time for questions at the end.

17           Cummins Westport is a 50-50 joint venture between  
18 Cummins and Westport. Cummins is out of Columbus, Indiana,  
19 and a major diesel engine manufacturer in the world, and  
20 Westport is a world leader in gaseous fuels out of  
21 Vancouver, Canada.

22           We market the 6 to 9 liter natural gas and propane  
23 platforms. They're manufactured by Cummins in America, and  
24 we've delivered over 20,000 engines worldwide. And we are  
25 supported locally through Cummins' distribution network.

1           Somebody had mentioned this earlier, I think just  
2 the previous speaker. This is kind of what natural gas has  
3 gone through in the last decade or so, and we like to  
4 compare it to the cell phone. If you remember the cell  
5 phone, in that top left corner up there, was a brick that  
6 you carried around, and now it's a necessity for most of us.  
7 And natural gasoline's done the exact same thing. It was  
8 really ugly at the beginning. It was bleeding edge  
9 technology. Now it's not only leading, but it is everyday  
10 technology, and we are -- we are there today.

11           Running through reasons if natural gas and diesel  
12 are just as clean as each other, why even bother. Well,  
13 there's three different reasons, and this is vetted through  
14 Cummins, which is, like I said, one of the largest  
15 natural -- largest diesel engine manufacturers in the world.  
16 So what I'm saying today, even though it's Cummins  
17 Westbrook, Cummins diesel sees this.

18           Emissions leadership. We will continue to be  
19 cleaner than diesel come 2010, especially with the  
20 greenhouse gases. And as Mr. Ward mentioned earlier, when  
21 you put in the biogas or cow manure or whatever you want to  
22 do, it's even more dramatic.

23           Energy security. It's a paradigm shift.  
24 Everybody thinks that we have gasoline on every corner of  
25 the United States, when in reality we have natural gas under

1 us all over the United States, and it's the gasoline that  
2 comes from 20,000 miles away. So it's another paradigm  
3 shift that we need to do.

4 And the economic benefits. The reliability is  
5 much better. We're getting better fuel economy, and then  
6 the fuel passes you've seen today, that can make a real  
7 difference in high-use fleets like refuse transit or pickup  
8 and delivery fleets.

9 We've got emissions results by you there in  
10 Sacramento, Sacramento RT, completed, and I could give you a  
11 more detailed report, but just to let you know, we are  
12 approximately 50 percent cleaner than the 2010 regulated  
13 emissions standards. So that's pretty dramatic. And that  
14 was end use on a Sacramento RT bus that they let us use,  
15 which we appreciate.

16 Lower greenhouse gas emissions. You've already  
17 seen that. I like to show this one. This is happening  
18 right here in Lindsay, California, so we are running on cow  
19 manure, which is great because they can put out a lot of  
20 methane. And we're just increasing -- or decreasing  
21 greenhouse gas emissions, and this is one of the ways we do  
22 it.

23 We improve fuel economy. So our fuel economy next  
24 Year with -- or actually with the ISL G engine is about five  
25 percent better. We prefabbed through with Orange County

1 Transportation Authority here in this area through a  
2 [inaudible] project, and they're seeing five percent better  
3 fuel economy with their new natural gas buses.

4 This is the ISL G engine for 2010. It's an 8.9  
5 liter engine, 250 to 320 horsepower, 660 to 1000 square  
6 pounds of torque, so basically what that means to you is it  
7 can take anything from like a street sweeper up to a -- we  
8 would call it a baby 8 vehicle. But it can also push a  
9 60-foot transit bus just to give you an idea of the range.

10 This is our technology for 2010, a three-way  
11 catalyst basically. It's the exact same thing you have on  
12 your car except bigger. And that's the -- it's a passive  
13 emissions, and that's where we control our emissions with  
14 our engine. And that's how we're able to get down to that  
15 below 0.2 gram Nox with the ISL G. We have 30 percent  
16 better torque at idle, which is great for these pickup and  
17 delivery, for refuse, because there's more power. It's more  
18 comparable to the diesel and then again the five percent  
19 better fuel economy.

20 Warranty. We have the exact same warranty as  
21 diesel. It runs through the Cummins system. It's -- it's  
22 seamless to the customer. They basically see us as Cummins.  
23 So everything that our diesel engines have, our natural gas  
24 engines have for warranty.

25 Availability. We've got great availability.

1 We're in every refuse area in the United States that you  
2 can get a diesel engine in. We're in every bus area that  
3 you can get a diesel engine in except for [inaudible].

4 Specialty. We're in capacity. We're in  
5 [inaudible]. Some other ones. [Inaudible] and then truck  
6 has come on lately with the Freightliner into the Peterbilt  
7 365 and 384 with Kenworth T800. So great availability in  
8 truck as well. We're also in Blue Bird and the other bus  
9 manufacturer. I'm spacing. Hawes. Thank you. So I  
10 apologize if anybody here is from Hawes. So we have  
11 availability with that.

12 You've been talking about service. We have 250  
13 distributor locations and 3800 dealer locations in the  
14 United States. We have the largest support network in the  
15 world. So people are going to be able to get these vehicles  
16 serviced.

17 That is my presentation. You had a few questions  
18 that I'll answer real quickly.

19 Market status. Current vehicle production levels.  
20 We could -- like the previous gentleman said, we can ramp up  
21 to more than probably the United States would ever do. We  
22 could probably do 20,000 engines a year on natural gas. To  
23 date there's only been about 25,000 engines delivered in the  
24 last decade. So we could produce basically what's been  
25 produced in the last decade in one year at the Cummins

1 engine plant.

2           At the Cummins engine plant, a diesel engine goes  
3 down the line, and right behind it can be a natural gas  
4 engine line -- a natural gas engine. There's no break or  
5 anything like that. It can be one after the other, mixed,  
6 matched, and everything else. There's no stopping  
7 production. And again, it's American made and it's in North  
8 Carolina.

9           What's the potential barriers? Of course, I would  
10 like vehicle deployment. But also we currently do not have  
11 a small engine anymore, come 2010, the 5.9 liter, because  
12 Cummins has switched over to the 6.7 liter. And in order  
13 for us to follow along, there's a lot of development and  
14 cost to switch over to that platform. And so we would like  
15 to go towards the ISB gas, but it's -- it's a different  
16 engine platform and everything. So that's something where  
17 we could see funding being put towards is the development of  
18 the small engine to do the more street sweepers and the yard  
19 hoes and whatnot.

20           Heavy-duty hybrids. That's a tough one for us  
21 because, as far as emissions, you're probably not going to  
22 get too much cleaner than our engine. If you put another  
23 catalyst on our engine, we can get down below -- our  
24 engineers can get down below 0.6. I'm sorry, 0.06, which is  
25 almost cleaner than ambient. And so the hybrid benefit

1   there would be lost, but if there was fuel economy  
2   benefits, maybe that could be seen there. But right now, we  
3   don't -- we don't see too much for the heavy-duty hybrids on  
4   natural gas as far as a future there.

5           There is a market. We believe it's truck, like  
6   beverage, port, regional haul is where we see the market  
7   where it's going. Also, refuse is converting over because  
8   of biomethane out of landfills. It makes perfect sense to  
9   pump their fuel at inexpensive cost from their landfills.

10           Our production costs have changed for vehicles.  
11   The materials have just gone up, you know. That's the  
12   biggest thing for us. And then you asked about overall  
13   costs of the vehicles. Next year, with all the emissions  
14   that are being put on the diesel engine with the urea and  
15   everything else, natural gas, just the engine, natural gas  
16   and the diesel engine are going to be almost comparable in  
17   cost. So the difference in the cost of the vehicle will be  
18   the tanks because you do have to put either the CNG tanks or  
19   the LNG tanks on the vehicle. But as far as engine costs,  
20   they're less than -- it's less than ten percent difference  
21   between the two of Cummins' ISL diesel and the Cummins  
22   ISL G -- Cummins Westport ISL G natural gas engine.

23           I'd be happy to take any questions if you have  
24   them.

25           MR. WARD: I did have one question. You said that

1 you have some -- some of your trucks operating on cow  
2 manure. And I was just wondering what the configuration of  
3 the tank is with cow manure.

4 MR. HANSON: With galoshes and a shovel.

5 MR. WARD: It's revolutionary [inaudible] on cow  
6 manure.

7 I understand it's biogas and that's a great  
8 opportunity. We really applaud it. I think we had some  
9 [inaudible] in that Hylride (phonetic) --

10 MR. HANSON: Yes.

11 MR. WARD: -- area as well so -- that's all I had.

12 MR. OLSON: Another question in the same project.  
13 What kind of cleanup is necessary for the biogas to use in  
14 your engines?

15 MR. HANSON: We have it. Actually, I took some  
16 slides out just to be time conscious. We do have specs that  
17 we -- we've released to the fuel providers and tell them  
18 what they need to meet criteria. And I don't know what the  
19 fuel providers do in the background to get it to our -- our  
20 specifications. But we have 15 or 20 things that it has to  
21 meet. And I'm told -- I'm not that technical on that side  
22 of it, but it's creepy crawlers that they get out with the  
23 system. And I'm sorry I don't have a better answer. But I  
24 can find out for you.

25 MR. OLSON: Yeah, I think we'd like to know more



1 about the cost of that compared to the cleanup H2S and CO2  
2 extraction that was needed to put that same kind of biogas  
3 into the natural gas pipeline. We're interested in knowing  
4 those kind of -- those differences in cost.

5 MR. HANSON: How much more -- it would be more  
6 economical to just put in a pipeline than to turn it into a  
7 vehicle fuel. Yes. Okay.

8 MR. OLSON: Just going back on the hybrid  
9 platform, does it make any sense -- for some of the  
10 applications like utility bucket trucks, you've got --  
11 you've got an electric system for -- that could be  
12 electrified. Is that -- is that -- you said it doesn't make  
13 sense for you for heavy-duty hybrid. What about some of the  
14 medium-duty levels for --

15 MR. HANSON: Well, as far as the -- because what  
16 happens is when you get into a lifecycle cost, it's hard to  
17 offset the additional costs that you're going to put on top  
18 of the hybrid. That being said, that doesn't mean it  
19 couldn't be done. And anything that can take the load off  
20 the engine, makes the engine run more efficient, more -- you  
21 know, so you're putting out less emissions. And so if we  
22 had hydraulic assist or electric or something like that,  
23 that doesn't mean the engine has to run all day and  
24 everything else, you're decreasing emissions. So that would  
25 be a benefit for the environment. We'd just -- we'd have to

1 see how much that cost would entail and the offset would  
2 be.

3 MR. OLSON: Is that something you would need -- we  
4 look at that as a prototype demonstration we'd want to look  
5 at. Is that of interest to you?

6 MR. HANSON: Yeah, that would be -- we're open to  
7 all ideas and looking at things that -- that it would make  
8 sense like that, exactly. We're doing something right now  
9 with the ISE down in San Diego around the V. But again, the  
10 V is going to be going away because Cummins has gone away  
11 from that platform. We physically don't have an engine. So  
12 things like that, yes, Cummins Westport would be open to  
13 things like that.

14 MR. OLSON: Very good. Thank you.

15 MS. BAROODY: Well, thanks, Dwight. Thanks for  
16 keeping that short.

17 MR. HANSON: Thank you for your time.

18 MS. BAROODY: Appreciate it.

19 Okay. We will take a lunch break right now and  
20 reconvene at 1:00 o'clock. Thank you.

21 (Break taken.)

22 MS. BAROODY: Welcome back. We're just going to  
23 take this time for public comment that we weren't able to do  
24 this morning. So if there are any questions, either in the  
25 audience or on WebEx, we can spend a few moments taking

1 those. And if you have something you'd like to say, just  
2 come on down to the podium.

3 Oh, okay. For WebEx, the phone lines are unmated,  
4 if you'd like to go ahead.

5 Well, maybe there's nobody with comments. Oh, we  
6 might have one here. Is it Dave?

7 MR. BRUDERMAN: Yes.

8 MS. BAROODY: Dave. Hi, Dave.

9 MR. BRUDERMAN: Madam Chair, my name is David  
10 Bruderman, and I am a professional engineer. I live in  
11 Gainesville, Florida, and have been active in the efforts to  
12 try to introduce alternative fuels and advanced vehicle  
13 technology since about 1990, focused on Florida. And I want  
14 to -- basically want to commend the State of California for  
15 your leadership and not just trying to clean up the air  
16 through advanced technologies and cleaner fuels but also  
17 break our total dependency on liquid petroleum fuels,  
18 because without the leadership of the State of California, I  
19 frankly don't think that we would be very far down that  
20 pathway.

21 So my hat's off to you all, both at your highest  
22 official level of elected officials as well as staff for  
23 doing the hard work, the heavy lifting, that's needed to  
24 basically provide the information. Do the analysis and get  
25 the data out there, actually communicate the facts that are

1 so important when you have this type of initiative.

2 I'd like to amplify -- well, basically, I think  
3 you need to have two things happen in our investment  
4 strategy for alternative fuels, and what I'm trying to do is  
5 take what I'm learning here, take it back to Florida, and  
6 educate our elected officials and community leaders at all  
7 levels. And we have a small business called Wise Gas Tank,  
8 and we are basically trying to build that infrastructure at  
9 the same time that we're trying to get the vehicles  
10 produced. And we're finding that having the chicken and an  
11 egg come together at the same time is extraordinarily  
12 difficult.

13 So I would want to amplify the comments made by  
14 the gentleman from IMPCO about the need for having bi-fuel  
15 vehicle capability for -- especially for the conversions.  
16 We run into -- as the price of gasoline and diesel fuel goes  
17 back up, and it's starting to do that again as the recession  
18 reigns and so forth, we're going to find more and more  
19 people who want to convert their existing vehicles.

20 And having a bi-fuel capability is absolutely  
21 critical to those parts of the country that don't have  
22 extremely bad air quality problems. And I've been in this  
23 business long enough to know that, you know, air quality has  
24 been the driver for the advanced vehicle technology,  
25 including the fuels, for most of the past 30 years. And

1 it's only been in the last -- since our military  
2 escalation in the Middle East that we've really started to  
3 become aware of the people, the problem, and the problem  
4 with petroleum dependency. And now, more recently, the  
5 issue of climate.

6           So we're at a nexus where I think there's an  
7 opportunity for California to help those of us in other  
8 parts of the country to -- to change the tone of the debate  
9 and focus more on low carbon deployment now of technologies  
10 that work, that are cost feasible, that are lower carbon,  
11 low carbon emission fuels and technologies.

12           And propane, natural gas, and some of the  
13 biofuels, and especially the advanced biofuels, offer that  
14 opportunity. And they offer it at various cost levels and  
15 it's -- so I think what I would like to advocate is that you  
16 not only have -- you have a program -- a policy program that  
17 focuses on bi-fuel or multi-fuel vehicle capability so that  
18 the original equipment manufacturers get the message that  
19 there are no technical barriers to widespread deployment of  
20 non-petroleum alternative fuels. The barriers are policy.  
21 The barriers are custom. The barriers are design issues on  
22 how do you design a vehicle.

23           You know, I've -- I've been fighting with the  
24 Department of Energy since 1992 about the storage problem  
25 for gaseous fuels. There is no storage problem for gaseous

1    fuels.  We have compressed gas cylinders that weigh  
2    virtually the same as a petroleum tank.  The problem -- but  
3    they take up three times or four times the volume.  If  
4    you're trying to get fuel efficiency in a vehicle, volume of  
5    the fuel tank is not a serious issue.  There's a problem  
6    with weight with the fuel tank but not a problem with  
7    volume.

8                So it would be very simple for the original  
9    equipment manufacturers to start designing all of their  
10  vehicles -- especially the ones that are servicing the  
11  fleets -- to make it easy for the consumer to have the  
12  choice of what fuel I want to buy, whether it's natural gas,  
13  propane, or E85.  That -- those vehicles could be designed  
14  from the wheels up to have the space on the vehicle to  
15  accommodate one or more fuel systems.  It could even have  
16  two systems, a liquid fuel system and space for a gaseous  
17  fuel system.  And if you want to make a vehicle more  
18  efficient by making it a hybrid vehicle, you could even do  
19  that by giving the additional space for the battery storage  
20  system.

21                So I -- I'm thinking that you've got a -- with  
22  this new plan that you're coming up with, that it would be  
23  really paradigm shifting, really revolutionary, if you could  
24  make a strong statement that you would like to see OEM  
25  vehicles coming off the assembly line that are multi-fuel

1 capable and start empowering consumers to make the  
2 decision rather than corporate executives in Detroit, who  
3 have shown that they don't know how to make very good  
4 decisions with respect to the automotive sector anyway. But  
5 let's give the consumer the power.

6 Don't have the government mandate it. You know,  
7 picking winners and losers, propane versus natural gas, is  
8 silly. Propane versus ethanol is silly. That -- that's not  
9 the way to go. We need market -- a market to work truly.  
10 But unfortunately, because this is a mass production  
11 business where you have to drive your costs down through  
12 volume as we've seen from several previous presentations, we  
13 have to have the OEMs in the game. And alternative fuels  
14 cannot be an afterthought. Alternative fuels need to be a  
15 mainstream thought, and these -- and the vehicles that are  
16 General Motors, Ford, and others, Chrysler manufactured, I  
17 think need to be alternative fuel capable right from the  
18 get-go.

19 And if we could make that one policy statement, it  
20 would be huge. And it wouldn't cost the taxpayers of  
21 California a lot of money to just make that statement. So  
22 thank you very much for creating this platform for us to  
23 vent a little bit and rant and rave, and --

24 MS. BAROODY: Thanks.

25 MR. BRUDERMAN: -- and have a good day.

1 MS. BAROODY: Thank you, Dave. Appreciate it.

2 Okay. If there are no more public comments -- any  
3 on WebEx? Okay. We'll move right along now to Jim Moore  
4 with Emission Solutions.

5 MR. MOORE: Good afternoon. Thank you very much  
6 for the privilege to stand before you and talk about what  
7 we're doing in the medium heavy duty version category.

8 Just a few real brief bullet comments, I am Jim  
9 Moore, president of Emission Solutions, and we're committed  
10 to gaseous fuel technology, investing in the things that are  
11 important and part of the economic energy security issues.  
12 We manufacture our 6-liter medium heavy duty natural gas  
13 engine that's qualified and certified by both CARB and EPA  
14 to [inaudible] in 2010. Because we do manufacture a clean  
15 engine, that engine qualifies for the maximum tax credit of  
16 \$32,000.

17 A brief company overview. We were founded by --  
18 in the late '90s. We were formed in '02. And we chose  
19 early on to work with the International Navistar diesel  
20 engine platform for two or three reasons. As you may be  
21 aware, Navistar is a dedicated diesel engine manufacturer,  
22 and they show no indication to do anything otherwise,  
23 although I'm happy to report that we may be getting a bit  
24 closer to the table with them than ever before. But we  
25 chose that engine platform for that reason.



1           Number 2, the International [inaudible] with  
2   that [inaudible] engine has always been a very durable, very  
3   popular engine. And so that's why we chose that engine  
4   platform to work with. This is primarily in the Class 6, 7  
5   truck category of school buses and trucks. And you can see  
6   the applications that are in our sweet spot. There's  
7   food/beverage distribution in this package, the school  
8   districts, and there's refuse trucks on the light end.

9           Kind of going counterclockwise, beginning with the  
10   upper left, you can see some of the applications that we  
11   have on the road. The first truck in the upper left is an  
12   Anheuser-Busch delivery truck in Houston. Distributors,  
13   they're an independent distributor for Anheuser-Busch  
14   Budweiser products. They happen to be the world's largest  
15   distributor of Budweiser products. You can see in that  
16   application the fuel cylinders are located underneath the  
17   driver's side door and the passenger side door.

18           The next picture is an Anheuser-Busch corporate  
19   truck. This happens to be a project that we're working on  
20   up in Long Island, New York. We'll be powering 22 of their  
21   trucks.

22           The next one, we repowered six school buses down  
23   in the Dallas area. This happens to be in [inaudible],  
24   Texas. This is a transit-style bus with rear engine mounted  
25   engines.

1           The next truck you see is a Pepsi bottling group  
2 truck that we just completed up in Salt Lake City.

3           Lower right-hand corner is a truck that we just  
4 delivered to the County of Los Angeles for [inaudible]  
5 Equipment Company of America.

6           The next truck looks old, and it is old. Even  
7 though we're only five or six years old, our technology goes  
8 back beyond ten years. This is a '91 Coca-Cola distribution  
9 truck in the Dallas, Texas, fleet that we retired more than  
10 ten years ago. And they just -- they just took this --  
11 these four trucks out of service within the last two years.  
12 So that technology prototype that we developed over ten  
13 years ago is what we used to leverage and go forward to what  
14 we're doing today.

15           The next school bus you see is from Tulsa,  
16 Oklahoma. We are starting a program to recall 140 of their  
17 school buses, and these happen to be conventional buses.

18           The last picture is a truck that we -- that we  
19 started delivering, one of 19 for the city of Kansas City,  
20 Missouri, for their [inaudible] application. And you can  
21 see in their [inaudible] truck and the [inaudible] Equipment  
22 Truck of America, we have the fuel systems mounted behind  
23 the cab, and they're 60 diesel gallons. There's four tanks  
24 mounted behind the cab.

25           Bottom center, you see a picture of our engine and

1 its simplicity. That is a model year 2010 certified  
2 engine. And you can see some of the comments in the lower  
3 left there. We use electronic throttle body. We have  
4 [inaudible] three-way [inaudible]. One thing that  
5 differentiates us from our competition, we are able to  
6 achieve 2010 certification without exhaust gas  
7 recirculation.

8           And that's a real plus because [inaudible] under  
9 the hood, so we don't need the amount of cooling capacity to  
10 the engine that other engine manufacturers use. Simple  
11 [inaudible]. The software that you see there on the engine  
12 controls not only everything on the engine, but it  
13 communicates with the electronic on the vehicle to run  
14 everything on the vehicle, from the dashboard, the  
15 [inaudible], to remote throttle body, to whatever.

16           I think it's the most simple engine in the  
17 marketplace today. And then in the lower right, you can see  
18 some of this that I've already -- that I've already  
19 mentioned to you.

20           Here's a spec sheet of this engine. And I know  
21 that you probably can't read everything on there, but I'll  
22 just highlight two or three things. This engine provides  
23 horsepower in the range of 175 to 300. It provides torque  
24 in the range of 460 to 900 foot pounds. And again, we're a  
25 2010 certified engine without any of the aftermarket devices

1 that the diesel engine requires. No diesel particulate  
2 filters. No [inaudible], not even any exhaust gas  
3 recirculation.

4 This is -- this is an instructive slide because I  
5 wanted you to see the power performance of our engine versus  
6 the International diesel engine that we replace. We work  
7 with new International engines -- they call it the Max Force  
8 VT -- but going back 15 years or so, back to 1995, they  
9 called it the DT 466, and then now they've gone to the Max  
10 Force DT.

11 And when -- the interesting thing about our  
12 strategy, we can not only repower existing vehicles that go  
13 back to model year 1995 through an engine-exchange program,  
14 but we pull the DT 466 out, send it to our engine  
15 manufacturing company, which is Springfield Remanufacturing  
16 Corporation in Springfield, Missouri. SRC was once owned by  
17 Navistar. They're now an employee-owned company. But they  
18 still do the preponderance of the Navistar diesel engine  
19 repowers. So for older engines that we can repower, SRC is  
20 our engine manufacturer.

21 For new engines, we can do the work in  
22 [inaudible], and we do it through the International dealers  
23 around the country. So we have our end not only from the  
24 Navistar International dealers but also Springfield  
25 Remanufacturing. So from a production standpoint, we really

1 don't have any limiting factors because we have dealers  
2 working with us from Westrux International here in the Los  
3 Angeles area up to [inaudible] in Long Island, New York, and  
4 you'll see those in just a moment.

5           But this is a Max Force DT. These are performance  
6 Curves that we achieved in the test area, 215 horsepower.  
7 We achieved 600 foot pounds of torque versus their 550 foot  
8 pounds at the same horsepower. At 300 horsepower, we  
9 achieved 900 pound feet of torque, and they achieved 660.  
10 Stating it another way, we can provide torque at lower RPM,  
11 or at the same RPM we can provide more torque than the  
12 diesel engine that we replaced.

13           Going forward, we have in our plans to develop a  
14 larger engine. I don't think you can see the writing there,  
15 but that is the Navistar Max Force 10 engine. We're going  
16 to be developing a 9.3-liter engine that will get us to 350  
17 horsepower and 1200 foot pounds of torque. That will open  
18 up, obviously, some avenues and applications that our 7.6 is  
19 a bit too small for.

20           The next group of slides will give you an idea of  
21 the kinds of customers that we're working with. One of the  
22 questions was, you know, what are we doing and what are the  
23 numbers? Our existing purchase orders -- and we can see  
24 some of these, the municipalities. There are some major  
25 fleet beverage distributors.

1           The last line there, Navistar Escobedo in Peru,  
2 we're working with the Navistar plant in Monterrey, Mexico,  
3 at their Escobedo plant. That plant manufactures pre-'07  
4 engine emissions, and we've got an order that we're  
5 beginning to work with that are going to Lima, Peru. So I  
6 have -- I'll show one more. There is going to be one  
7 initially, but the initial order is for 50 out of 250.

8           That will give you an idea of the current P.O.'s  
9 that we have. From the stimulus funding that was just  
10 announced, the best we can tell, we have a minimum of 265  
11 orders there, and some of those -- and out of those, Suffolk  
12 County, Nassau County, New York, that's the MDA, Department  
13 of Transportation, Sysco Foods of Salt Lake City, and then  
14 there's a school district in New York.

15           So if you have what we -- what we know we've been  
16 approved for and the stimulus funding and our P.O.'s,  
17 there's 500 sales there. And these are projected new orders  
18 for 2010. And again, you can see from this that it pretty  
19 well covers the spectrum, food/beverage, school districts,  
20 municipalities, refuse, and the like.

21           I want to spend a little bit of time on this slide  
22 because it talks about what we're doing specifically in  
23 California. I mentioned Westrux International a moment ago.  
24 Westrux happens to be the largest International dealer west  
25 of the Mississippi River. They've got nine or ten

1 dealerships throughout Southern California, and we will be  
2 implementing at long last, after several months of delays, a  
3 demo project working with Westrux, with Clean Energy, with a  
4 tank company and [inaudible] industries here in Long Beach.  
5 And the way this demo project will work is as follows.

6           Westrux will provide two new trucks, one a  
7 food/beverage type truck and one a municipal utility  
8 construction type truck, and we're going to repower those  
9 with our engine. The International dealer will do the  
10 engine -- do the engine conversion. And because it's a new  
11 truck, that dealer will do the work in-frame. It will not  
12 have to be an engine exchange. They simply drop the pan,  
13 they pull the head, they put our CNG components on it, and  
14 it becomes a model year 2010 CARB-certified engine.

15           Our plan is to keep these demo trucks in service  
16 for a minimum of a year, maybe a year and a half. And we're  
17 going to address working with our strategic partners out  
18 here to identify the customers that we're going to pick to  
19 use these demo trucks. At the end of the period, we should  
20 have worked with 25 or 30 food/beverage customers and 25 or  
21 30 municipal companies -- or entities rather, construction  
22 entities. And each of these potential customers will be  
23 able to drive these demo trucks for two to four weeks to try  
24 the engine technology, and I think it's a great way to get  
25 our product in the marketplace and get good P.R. for not

1     only Westrux and ESI but Clean Energy and the environment  
2     as well.

3             The second project that we're very excited about  
4     is a project that we're getting funding assistance from  
5     Southern California Gas Company to convert school buses.  
6     Interestingly, California is the only state that requires  
7     crash testing for what we call an existing diesel-powered  
8     school bus.

9             So our plan is we've got a team working, and we're  
10    going to be buying a couple of used International chassis  
11    school buses. We have found this to be a bit bigger  
12    challenge than we thought it would be. There's a firm here  
13    in California called Carco that will actually crash test the  
14    buses once they've converted them. This will be under, of  
15    course, the California Highway Patrol's auspices and  
16    blessings. And then, once we get approval, then we're going  
17    to start repowering existing -- existing school buses with  
18    our engine.

19            So these two projects, I think, are going to stand  
20    Emission Solutions and our strategic partners in good stead  
21    in the state of California.

22            So, in summary, I'll reiterate what I said  
23    earlier. We're committed to gaseous fuels. Our engines are  
24    model year 2010 certified and qualified for the maximum  
25    credit. And we heard Curtis Donaldson mention briefly this



1 morning, and I want to close with this, as I travel the  
2 country, we're finding a lot of interest in the propane  
3 industry about this particular platform. And since their  
4 8.0-liter engine is going away, we're -- we're going to be  
5 submitting to the Propane Education Resource Council at  
6 their October meeting a development project to fund the  
7 development of certification of this same 7.6-liter engine  
8 in a propane version.

9           The propane industry wants to initially target  
10 their propane bobtail delivery trucks, and I'm told by the  
11 propane industry, Curtis and his people, that they replace  
12 3- to 5,000 of their bobtails every year. And the propane  
13 industry would love to have a propane engine platform  
14 driving the trucks with the product they're hauling.

15           So it's my opinion that between a dedicated model  
16 year 2010 CNG engine and a 2010 model year certified propane  
17 engine, Emission Solutions are prepared to impact the  
18 marketplace substantially. That's my presentation, and if  
19 you have any questions, I'd be happy to answer them for you  
20 at this time.

21           MS. BAROODY: Staff, questions?

22           MR. OLSON: Can you just clarify, so all of your  
23 manufacturing is in Texas? Is that how you --

24           MR. MOORE: Well, the only thing that we have in  
25 Texas is an R&D facility. All of the engine work will

1 either be done by Springfield Remanufacturing Corporation,  
2 the way that works. Let's say in vehicles older than model  
3 year 2004. That year, Navistar went from a 12-valve engine  
4 to a 24-valve engine. And model year 2004 and earlier had  
5 enough miles and use that it requires an engine exchange, so  
6 the way the logistics works, the dealer in the location  
7 we're working with would pull out that old DT 46 diesel,  
8 ship it to Springfield Remanufacturing, they would  
9 manufacture the engine to our specs, and they would ship the  
10 finished product back to the customer.

11           Newer engines, the work would be done at the  
12 dealerships around the country what I call in-frame. They  
13 drop the pan, they pull the head and it's got a few miles  
14 it, we'll re-sleeve it and put new bearings, but obviously,  
15 if it's a brand-new truck like I mentioned -- you saw Kansas  
16 City and just signed a contract with the International  
17 dealership in Dallas to do 24 refuse trucks for the City of  
18 Dallas -- that work will be done by the dealership. It will  
19 all be done in-frame.

20           We will provide, for lack of a better word, kit  
21 components to the dealership. It will be a head, machine  
22 for spark plugs. It will be the [inaudible] body, the ECU,  
23 the wiring harness, the fuel injectors, everything  
24 peripheral. We won't change anything in the internal of the  
25 engine.

1           Okay? So from the manufacturing perspective,  
2 when I say we don't have any constraints because either  
3 dealers around the country directly or Springfield  
4 Remanufacturing receiving and resending the engines back to  
5 the dealers to do the installation, all the work will be  
6 done by the dealers around the country.

7           MR. OLSON: And are you part of Navistar's --  
8 their federal economic stimulus award that they received?

9           MR. MOORE: Yes, sir.

10          MR. OLSON: Okay.

11          MR. MOORE: Yes, sir.

12          MR. OLSON: Are you -- to what extent are you --  
13 have you any interest in a natural gas platform hybrid  
14 electric? Do you have any --

15          MR. MOORE: We are very interested in that, and  
16 we're talking to some dealers about that. We don't have any  
17 potential appliance at this moment. Where's Rick? Rick  
18 Teebay and I had just been talking earlier today about that  
19 very thing. So I think in the very near future -- I'm not  
20 sure when or where we -- but we are very interested.

21                 In fact, Navistar has got a guy named  
22 Jim Williams. And Jim Williams was a 40-year veteran of  
23 Navistar. And he was in my office almost two years ago now,  
24 and his goal was to marry our engine and their hybrid  
25 vehicle. He took it back to Navistar, and it got swept away

1 from the table.

2 But in essence what that did was it started a  
3 dialogue between myself and Navistar. I might say  
4 completely without success until the last two, three months.  
5 And I will say that between the pressure from dealers and  
6 hearing from companies like Ryder and AT&T about interest in  
7 our engine, we have reason to believe that Navistar is  
8 warming up to the idea of working with us.

9 But, Tim, to answer your question, we have extreme  
10 interest in doing that. Yes, sir.

11 MR. OLSON: So that -- that will be one of the --  
12 one of the candidate areas that we want to explore with our  
13 prototype demonstration funding that we'll put out here very  
14 shortly.

15 MR. MOORE: We have an interest, and we'd love to  
16 be the candidate to work with you.

17 MR. OLSON: Very good.

18 MR. MOORE: Anything else?

19 MS. BARODY: That should do it.

20 MR. MOORE: Hey, thank you so much. Appreciate  
21 your time.

22 MS. BARODY: Thanks for coming.

23 Okay. Next we have Port of Long Beach, Thomas  
24 Jelenic.

25 MR. JELENIC: Good afternoon. My name is Thomas

1 Jelenic. I'm Assistant Director of Environment Planning  
2 with the Port of Long Beach, and I just wanted to talk to  
3 you about the status of the Port of Long Beach's clean  
4 trucks program, which we're implementing with partners Port  
5 of Los Angeles.

6           There is a significant focus on natural gas  
7 vehicles within our program, and we've had some success with  
8 natural gas. Starting on that, I just wanted to go over a  
9 few things that the ports have been working on that are  
10 consistent with the goals of AB 118 in terms of reducing  
11 dependence on foreign oil and reducing CO2 intensity.

12           We have, of course, our clean air action plan,  
13 which focuses on reducing criteria pollutants and reducing  
14 emissions. We have the clean trucks program, which I'll  
15 talk about in a second, which offers incentives to -- to  
16 offset incremental costs of alternative fuel vehicles. We  
17 have tenant and tariff requirements that create incentives  
18 for people to move to cleaner technologies like natural gas.  
19 We have, through the TAP, our technology advancement  
20 program, which is investing in technologies like plug-in  
21 hybrid electric vehicles and battery electric [inaudible]  
22 demonstrations. We've also conducted demonstrations of alt  
23 fuels for off-road equipment.

24           We've been working with our partners like AQMD and  
25 Clean Energy to expand alternative fuel infrastructure in

1 and around the ports. We've been working on cold ironing,  
2 which reduces both criteria pollutants significantly and  
3 also has greenhouse gas benefits by taking power production  
4 from the grid rather than on vessels itself. And we're  
5 currently developing a climate change greenhouse gas  
6 strategic plan, which will hopefully be coming out shortly.

7           Through the clean trucks program, the ports have  
8 been incentivizing natural gas -- natural gas trucks. We  
9 started almost two years ago at the -- once the clean air  
10 action plan was approved and what we now call a Legacy Fleet  
11 program. We put 107 Kenworth's on the street that are based  
12 on the ISX-G engine. These are Class A trucks, and it was  
13 our first attempt to get natural gas trucks into the  
14 drayage -- drayage market.

15           In addition to that, we've gone on to provide  
16 additional port funds and Prop 1B -- Prop 1B funds to  
17 provide bigger grants and for more vehicles. We've been  
18 working with AQMD on additional solicitations. We've  
19 conducted a couple solicitations last year under Prop 1B.  
20 AQMD just completed a new solicitation under Prop 1B where  
21 we provided additional matching funds that I'll get to in a  
22 moment for LNG vehicles.

23           Through these programs, we've been able to make  
24 nine different LNG truck variations available based on make,  
25 model, and cab configuration. There are two different

1 platforms that have been made available in general. One  
2 is the ISL-G, a dedicated spark-ignited natural gas engine  
3 that has been made available at four different  
4 manufacturers. In addition, there is the ISX-G HBDI pilot  
5 injected natural gas engine, 95 percent LNG, 5 percent  
6 diesel. Depending on the needs of the drayage industry,  
7 applicants to our program have selected the appropriate  
8 truck. And both have been popular.

9           Through our program, we've provided subsidized  
10 costs. The typical way we've done this is through a  
11 subsidized lease. We offer both -- we have offered both  
12 straight grants for the purchase of alternative fuel trucks  
13 and for -- and the subsidized lease. The -- we base our  
14 incentive on the most affordable truck that's out there,  
15 which is those based on the ISL-G configuration. Through  
16 that, a lease would cost -- cost the applicant \$300 a month  
17 for the first two years and \$500 a month for the following  
18 five years on a seven-year lease.

19           The grant option would create an incentive of  
20 \$105,000 on a truck valued at \$160,000, leaving a  
21 participant cost of \$56,000, substantially cheaper than  
22 going out and purchasing a new diesel truck today.

23           Similarly, the ISX-G, we also offer subsidized  
24 lease or grant. These costs are higher due to the higher  
25 initial cost of that vehicle at about \$197,000. We keep the

1 grant prize, the amount we offer, the same so the amount  
2 that the participant has to provide goes up.

3           Currently, we've deployed about 450 LNG trucks  
4 based on information in our DTR, either through trucks that  
5 we have provided incentive funds or those that have been  
6 privately funded. There is the initial 107 in our legacy  
7 fleet, 154 were done through the clean trucks program of  
8 Proposition 1B funds, 130 were through the initial early  
9 grant Prop 1B by AQMD, and there have been nearly 60 trucks  
10 that have been entirely privately funded.

11           In addition, we have -- we held a solicitation a  
12 few months ago for yet more trucks, and we -- we expect 50  
13 more LNG trucks to be on the road shortly, and AQMD just  
14 approved their rank list under Prop 1B. Through that nearly  
15 \$49 million solicitation, the Port of Long Beach is adding  
16 \$5 million to provide additional incremental cost cover --  
17 increasing -- an increased amount of the funding for LNG  
18 trucks.

19           As you know, under Prop 1B, \$50,000 per truck is  
20 available. We're providing an additional \$35,000 per truck  
21 and AQMD providing an additional \$15,000 per truck so that  
22 through this solicitation, \$100,000 grant for an LNG truck  
23 is made available.

24           So far the Port of Long Beach alone has provided  
25 \$8 million in our initial subsidy for the legacy fleet,



1   \$30 million through the clean trucks program, and \$5  
2   million through AQMD for the current Prop 1B solicitation.  
3   In all, we've made \$45 million available for LNG trucks, and  
4   additional funds were also made available for diesel trucks.  
5   So it's been a significant investment.

6           One of the things that we recognized early on is  
7   if this was going to be successful, we needed to expand the  
8   availability of infrastructure here. Just a few years ago  
9   there was essentially no LNG fueling infrastructure within  
10  the port areas. Today we have two large stations that are  
11  currently operating. One is the Carson station, which is  
12  operated by Clean Energy. And the other is our port station  
13  located at Anaheim and "I" Street. That one's also operated  
14  by Clean Energy. There are three additional stations that  
15  are planned: one in Wilmington, one in North Long Beach, and  
16  one on Pier "S."

17           Anaheim and "I" Street is the result of what we  
18  call HDV2 in our clean air action plan. That -- that  
19  station was -- is the result of a solicitation the two ports  
20  jointly put out to find a tenant to operate an LNG fueling  
21  station. Clean Energy responded to that, and as a result we  
22  now have one of -- according to Clean Energy, one of the  
23  largest natural gas fueling stations in the world for  
24  trucks. It has two 25,000-gallon LNG tanks. It has six LNG  
25  dispensers, two CNG dispensers, and Phase 2 plans to expand

1 the capacity.

2           The Carson station is operated -- is located at  
3 Seven Counties Express, which is a drayage company that  
4 serves the ports. It is a pump station that they -- that  
5 will serve anybody, not just the Seven Counties fleet. It's  
6 capable of providing fuel for 70 LNG trucks -- or excuse me,  
7 the -- Seven Counties operates a fleet of 70 trucks, which  
8 provides the base for that station, but other drayage  
9 services use it and has a throughput of nearly -- of about  
10 320,000 LNG gallons per month.

11           In addition, we've made available our clean truck  
12 center located on Pier "S" where we -- folks can come in and  
13 provide -- obtain information about our alt fuels programs,  
14 our -- and how to obtain trucks, either through our programs  
15 or through AQMD's programs, and we've made an 800 number  
16 available.

17           Just to give you some progress on what we've made,  
18 as you may know, the clean trucks program is based on the  
19 concept of the progressive ban that will require  
20 progressively cleaner trucks through -- until -- January 1,  
21 2012, all trucks will have to meet a 2007 standard. We've  
22 made a lot of progress there. Over 50 percent of the  
23 moves -- cargo moves -- are by clean trucks at the Port of  
24 Long Beach. We expect that number to increase substantially  
25 through the next ban date, which is at the end of this year,

1    which will eliminate all pre-'94 trucks and require '94  
2    through '03 trucks to be either retrofitted or replaced with  
3    a cleaner truck.

4                When it comes to increasing the penetration of  
5    natural gas into this fleet, the progress has been steady  
6    but much, much slower. And I think it reflects the cost of  
7    getting into these trucks and the need for even more money  
8    to be made available for subsidies.

9                You see it up close, right now, just from the five  
10   percent of all moves, cargo moves through the Port of Long  
11   Beach are made by natural gas trucks. Basically, 12 months  
12   ago, that number was zero. When you think about the number  
13   of moves that come through the ports, that's -- that is  
14   still a substantial number of trucks, but we have a long way  
15   to go if we want to increase the natural gas penetration.  
16   And you've seen that increase has been made by a  
17   corresponding decrease in the number of diesel moves at the  
18   Port of Long Beach.

19               There are issues that remain in expanding natural  
20   gas penetration and alt fuels at the ports. Incremental  
21   cost still remains high despite these efforts. Our initial  
22   hopes were that the clean trucks program would bring down  
23   the incremental cost of natural gas trucks. They remain  
24   high and, as a result, require major subsidies.

25               Fueling infrastructure around the ports are

1 improving significantly, but there is a question about the  
2 infrastructure within the Greater South Coast Air Basin and  
3 availability of infrastructure in the Inland Empire.

4           And there are questions about what would continue  
5 to drive the choice towards natural gas. Next year, all  
6 trucks will have to meet the 2010 standards. When it comes  
7 to greenhouse gas, emissions are highly dependent on the  
8 feedstock and well to well factors. Prices are highly  
9 volatile. When -- when diesel fuel -- when oil was over  
10 \$100 a barrel, it was easy to encourage people based on the  
11 economics to move to natural gas. Now that price has come  
12 down, that incentive has been removed and people don't  
13 always take a long-term outlook when it comes to cost.

14           Incremental cost. Fueling tanks -- the fuel tanks  
15 and other natural gas components of the vehicle are still  
16 expensive and have a significantly long lead time for the  
17 manufacture of the vehicles.

18           And there was a question of what the technologies  
19 down the road are going to be. Hybridization of diesel  
20 trucks will provide obvious greenhouse gas benefits shortly.  
21 And while hybridization is certainly possible for natural  
22 gas, we -- we don't know what incremental -- additional  
23 incremental cost for natural gas will be. We'll have to  
24 also see to what degree hydrogen fuel cells or propane enter  
25 this market. Right now it's essentially nonexistent. And

1 all these create questions.

2           The biggest thing that's missing, though, right  
3 now is simply additional money. As we've gone through this  
4 process, there have been a lot of ups and downs with  
5 Proposition 1B, the suspension of the program because of  
6 State finances created a lot of uncertainty and resulted in  
7 missed opportunities to move people to natural gas as they  
8 had to make decisions in the absence of incentive funding  
9 for natural gas. Now that that program has been reinstated  
10 to a degree, as the State's finances appear to be coming  
11 into order, there may -- there may be additional desire to  
12 get back into natural gas. But as time lines -- deadlines  
13 for both the clean trucks program and the State's drayage  
14 truck rule are impending, we need to -- truck owners will  
15 have to make quick decisions as to what sort of technology  
16 they will invest in for the long term.

17           So without additional funding, it will be  
18 difficult to encourage people to move to natural gas. And  
19 that's all I have for you. If you have any questions, I'd  
20 be happy to answer them.

21           MS. BAROODY: Thanks, Thomas. Any questions?

22           MR. OLSON: Thanks a lot for a nice overview of  
23 that, where you are. Can you -- I guess one of the things  
24 that -- on your truck program, my memory in some of the  
25 early meetings that you're -- I can't remember the exact

1 numbers you were trying to change out, 7800 trucks between  
2 two ports. Is that one of your target goals for --

3 MR. JELENIC: Well, our initial number was  
4 something like 16,800.

5 MR. OLSON: Yeah.

6 MR. JELENIC: Things have changed a lot. One,  
7 we've seen -- obviously, the economy has changed. That has  
8 led to significant decrease in the number of truck moves in  
9 and out of the port and, as a result, the number of trucks  
10 necessary to support that. Hopefully, cargo will return,  
11 and those numbers will come back. But in the meantime, we  
12 need less trucks.

13 We're -- also, as we move closer to the ban dates,  
14 we expect to see that the cleaner trucks are used more  
15 intensely, more trucks per day than other trucks. We're  
16 already seeing that where either a clean diesel or a natural  
17 gas truck is -- makes twice as many trips per day than an  
18 older truck. And so there is additional room there for  
19 increased efficiency in the moves.

20 So we're -- we think -- right now our guess at  
21 this point is we need about maybe 90 to 9000 clean trucks to  
22 serve the port once everything's fully phased in based on  
23 current levels of activity. Right now we have over 5000  
24 clean trucks, and we're adding trucks every -- clean trucks  
25 every week. The current Prop 1B solicitation will hopefully

1 add 500 clean trucks to serve the ports, so we're on our  
2 way. But the number's much lower than what we first  
3 estimated.

4 MR. OLSON: So when you say 5000 clean trucks and  
5 your goal 8000, 9000, is that -- a large part of that is met  
6 by clean diesel?

7 MR. JELENIC: Yes.

8 MR. OLSON: [Inaudible] diesel? How much?

9 MR. JELENIC: Right now the majority is being met,  
10 unfortunately, through clean diesel. There is probably --  
11 hasn't been -- there is much more private investment than we  
12 expected through the clean trucks program. The way we  
13 structured the clean trucks program was we created the clean  
14 trucks fee, which charged a fee on dirty diesel, which would  
15 in turn be used to offer incentives to -- for both clean  
16 diesel and LNG.

17 With the way the incentives were set up, LNG  
18 would -- would be more favorable. What we've seen happen is  
19 there was more private investment than we expected and --  
20 and less -- fewer LMCs took advantage of the subsidies. As  
21 a result, that private investment took the form of diesel  
22 while most of the investment that we made took the form of  
23 natural gas.

24 So it's been dominated by diesel. And to the  
25 degree that additional funds become available, we can

1 continue to get additional alternative fuel vehicles out  
2 there.

3 MR. OLSON: And your process of when you do these  
4 incentive grants, the ports are buying the trucks and then  
5 leasing them? Is that the --

6 MR. JELENIC: No. No, no. We -- we don't want to  
7 get into the business. What we -- what we did is we worked  
8 with leasing companies, in this case Daimler, to -- to  
9 basically bring the -- the truck manufacturer, the leasing  
10 company, Daimler-Crossroads, and the applicant together.  
11 We -- we -- so we -- Daimler would lease the trucks directly  
12 to the applicant under contract terms that we've arranged  
13 with Daimler.

14 MR. OLSON: Okay. I wanted to ask, since you  
15 mentioned the cold ironing and some of these other -- your  
16 cold ironing are stationary projects? Are any of them  
17 mobile systems?

18 MR. JELENIC: Oh, right now the -- when I refer to  
19 cold ironing, I'm referring to grid-based power. Those are  
20 all stationary, so the ships will connect to basically an  
21 outlet that's constructed into the wharf. When it comes to  
22 alternatives to cold ironing, we are investigating  
23 technologies like AMECS --

24 MR. OLSON: Yeah.

25 MR. JELENIC: -- Advanced Marine Emission Control



1 System. Right now the demonstration that we're about to  
2 begin with our tenant, Metro, will be a fixed system. But I  
3 know ACTI, the creator of that technology, does envision a  
4 mobile-based system.

5 MR. OLSON: And in the same line of -- the same  
6 kind of thinking here, are you -- where on your priority  
7 list is -- I know this is kind of off the natural gas topic,  
8 but is your -- any kind of electrifying rail, is that still  
9 one of your priorities?

10 MR. JELENIC: We are currently engaged in a -- we  
11 have a solicitation out on the street right now for what we  
12 call the zero emission container movement system. And so  
13 we're -- we're actively looking for ways to reduce emissions  
14 from rail activities. The -- the deadline for that  
15 solicitation was recently extended and we're -- we know  
16 we've had several companies express interest, but it has not  
17 closed yet.

18 MR. OLSON: Okay. Thanks a lot.

19 MS. BARODY: Thank you very much.

20 MR. JELENIC: Thank you.

21 MS. BARODY: Okay. We'll move on to fuel  
22 infrastructure next. We'll take a five-minute stretch break  
23 while Mike Eaves comes up for Clean Energy.

24 (Break taken.)

25 MS. BARODY: Okay. We've had our five-minute

1 stretch, and I'd like to welcome Mike Eaves, Clean Energy.

2 MR. EAVES: Where's my slides?

3 MS. BAROODY: Oh, give us a minute. Pilar was  
4 loading another presentation.

5 MR. OLSON: We can ask you some questions first,  
6 Mike, if you'd like.

7 MR. EAVES: Ask away.

8 Thank you. Good afternoon. My name is Mike  
9 Eaves. I'm with Clean Energy, and I work in the area of  
10 technology advancement for Clean Energy.

11 I was asked to speak about infrastructure, and  
12 since 2006-2007, I, as the head of the California NGV  
13 coalition, and part of our 1007 process, I gave a lot of  
14 numbers on what the industry was like at that time. And  
15 some of those numbers were a surprise to some people on the  
16 Energy Commission. I thought I'd kind of review where we  
17 were in January of '07 versus where we are right now.

18 First off, let me throw this in on world vehicles.  
19 5.6 million a couple years ago. 9.8 million. It's very  
20 interesting that the International Association of Natural  
21 Gas Vehicles came out in April -- April or May of this year  
22 with their statistics -- global statistics, and they had  
23 10.1, 10.2 million. So -- but it's a long process of many  
24 countries reporting, and the numbers seem to be stabilized  
25 here about 9.8. And you can see, that's pretty darn good

1 growth in a couple years.

2           The other thing I want you to notice, and it's  
3 particularly important when you start looking at California,  
4 look at the number of -- of stations in the world from  
5 10,000 to 14,000. That comes out to 5-, 600 vehicles per --  
6 per station, and that will automatically tell you that the  
7 world market is 97, 98 percent light-duty vehicles, bi-fuel  
8 vehicles.

9           In the U.S., we go from 136,000 down to around  
10 100,000. I've circled the 100,000 because NGV America and  
11 Clean Vehicle Education Foundation did a lot of work last  
12 year for Department of Energy trying to quantify the  
13 vehicles in the U.S. Now, we used to have 180,000. We used  
14 to 130,000. Going from probably only about 100,000 vehicles  
15 out there. And that's counting noses with everybody that --  
16 that they knew of, because we know where -- where they are.

17           Look at the station count. It's gone from 1600  
18 down to 800. The input -- now, these numbers are from the  
19 International Association of Natural Gas Vehicles. The  
20 numbers that NGV America came up with for DOE last year were  
21 about 1100 nationwide. And fuel sales of natural gas as a  
22 transportation fuel, about 300 million gallons in 2008  
23 reported by Department of Energy. I don't have the number  
24 for 2007.

25           When you look at the ratio of vehicles per

1 station, we can see that, you know, there's something  
2 different here. The difference is we're talking about  
3 higher fuel use fleet vehicles.

4 Now take a look at California. 28,000 a couple  
5 years ago. I don't know if it was 28- or 30,000 reported.  
6 Over 30,000 now. We've added a lot of -- we've added  
7 probably 500 taxis. We've added over 1000, 1500 trash  
8 trucks. We've added 500 vehicles that they've got to  
9 report. And we've got -- the station count in California  
10 has gone up to 420. We have 135 public access there.  
11 California fuel sales, this was at the end of 2008, was  
12 145,000 gallons.

13 So we can see California is about 50 percent of  
14 U.S. You look at the stations, we're about 50 percent of  
15 U.S. We have higher -- we have lower vehicle to station  
16 ratio and, therefore, it says we're primarily either heavy  
17 duty or high fuel use fleet vehicles.

18 For the infrastructure, there is no build it and  
19 they will come strategy. We did have that back in the '90s,  
20 and it -- it did not work. Infrastructure requires that we  
21 co-develop stations and vehicles at the same -- same time.  
22 We start with stations that serve high fuel use fleets.  
23 That gets a dot on the map. We base load the station with  
24 sufficient load to -- for that station to be profitable in  
25 about three to four years. So it isn't profitable on day

1 one, but -- but by vehicle increments -- additions over  
2 three or four years, it is economically viable.

3 We've designed sufficient fuel capacity and to  
4 expand the fuel sales far beyond what the initial  
5 requirement is. We've put in public access to allow  
6 expansion to other fleets. And we expand station throughput  
7 by finding collateral fleets to fuel at that same location.

8 Market growth eventually leads to a network of  
9 stations where green penetration vehicles can -- can take  
10 place with or without any infrastructure width. That's the  
11 situation we're in here in Southern California. We can add  
12 vehicles. We've talked to offshore OEMs about bringing  
13 their product here, and we've said that there is sufficient  
14 capacity and we could add 100,000 vehicles into this  
15 marketplace and not bat an eye because you're talking about  
16 vehicles that consume 3-, 4-, 500 gallons a day -- or a year  
17 versus your high fuel use fleet vehicles that are 10-, 15-,  
18 20,000.

19 The profitable target throughput for folks like us  
20 in the industry for many years now has been advertised at  
21 about 1000 gallons a day, either diesel equivalent gallons  
22 or gasoline equivalent gallons. And you look at the kinds  
23 of vehicles that make up that, Class A trucks at 20,000  
24 gallons a year, refuse trucks at 10, even the -- even the  
25 two-shift taxi is 7500 gallons a year. So look at -- all

1 the way to the right and look at the low number of  
2 vehicles it takes to really base load a station to be  
3 profitable.

4           Furthermore, throughput justifies the capital  
5 expense that we pay. And we're building big stations.  
6 We're not scooping on capacity. We used to try to size  
7 capacity for the specific fleets. We don't. We put in many  
8 stations now, expecting major growth. Throughput --  
9 profitable throughput, 1000 gallons a day gives us -- covers  
10 our O&M costs and all of our overhead and profit. And  
11 reportedly, it offers a competitive fuel price to customers  
12 to justify their outlay for vehicles.

13           Some more design criteria. There's design for  
14 each system for the load. Put in smaller compressors, no  
15 redundancy. We had large reliability issues. We had  
16 minimum public access capability. If you size it for a  
17 fleet, you don't really have a lot of excess capacity, even  
18 though we did have public access dispensers.

19           Today, for Clean Energy, our systems are modular,  
20 they're redundant, they're high capacity systems. We have  
21 prefab systems. We've come up with engineering designs for  
22 about three basic systems. We have all the compressor  
23 manufacturers build equipment to our specification and put  
24 it in cargo containers. It's all identical. Service and  
25 maintenance people know exactly where to find everything in

1    there.  It's the same skid after skid after skid.  We've  
2    got large compressors.  We're using -- in a given module,  
3    we're having 800 to 1000 cubic feet a minute total capacity  
4    in one of these container cargos.  And that's in days --  
5    compared to early '90s when we put 50, 100, or 200 CFM  
6    compressors in.

7                These are some of the stations.  The upper left is  
8    our new truck station at Anaheim and "I" just a few miles  
9    from here.  That can accommodate six lanes right now of  
10   truck traffic, expandable to ten.  We'll have 100,000  
11   gallons storage on site.  We've got, lower left, LAX.  
12   Multiple dispensers.  That station has grown tremendously.  
13   That is now putting out about 6000 gallons a day of fuel.  
14   It services police vehicles, taxis, limos.  We put in two  
15   transit dispensers to handle transit buses that come through  
16   there.  And then the last picture, on the lower right, is  
17   our station in Lima, Peru.  Up until January of -- up until  
18   January of this year, it was the largest CNG station in the  
19   world.  It had 32 hoses for dispensing fuel and about  
20   February or March was -- was passed by two stations in  
21   Southeast Asia at about 36 and 38 hose dispenser facilities.

22               So the last slide I put in, we work with fleet  
23   customers.  These are refuse companies.  We'll put in  
24   [inaudible] stations where they can fill overnight and be  
25   fully filled when they go out the next day.  But we also put

1 in public access at those stations so that we can handle  
2 all the fleets.

3           So take a look at the stations and market  
4 development. Stage 1 was kind of a Greenfield. We have to  
5 go in -- if we have to go in to an undeveloped area, we have  
6 to focus on high fuel use fleets. We have to grow the  
7 vehicles and grow the throughput to be profitable. And a  
8 good example of that is -- a Greenfield site is Chicago.  
9 There's absolutely nothing there, and we're going in and  
10 starting with putting in a station close to O'Hare Airport  
11 and down at City Center and focus on taxis as a -- as a  
12 launching place for Chicago.

13           Then you've got Stage 2. You've got limited  
14 market, and we focus on identifying new fleets in the areas  
15 and trying to get synergies with existing stations. A good  
16 example of that is someplace like Sacramento. You've got a  
17 few stations but really don't have a concerted marketing  
18 area -- effort going on in that area.

19           And then Stage 3 is good penetration of NGVs.  
20 Los Angeles and San Francisco are the area or two areas like  
21 that. And now we can go target major corporations. We're  
22 targeting people now like AT&T and Verizon, and they're  
23 looking at network, and they say, okay, that's fine, but,  
24 you know, we need one more station over here. Well, we can  
25 do that. We're not building 20 stations for somebody like



1 AT&T. We're building -- we're building one or two.

2           The column next phase of development is adding  
3 dots to the map and doing it without costing an arm and a  
4 leg. We're working with a lot of world manufacturers to  
5 identify smaller packaging concepts and add network  
6 capacity. This is a picture of a Galileo Nano Box. It's a  
7 self-contained system. It all -- it will sit on a dispenser  
8 island. So if you have a gasoline station and you want to  
9 pull a pump and put in a CNG station, this will fit the  
10 bill. But it offers 100 gallons an hour capacity. That's  
11 different than the test hydrogen stations that are out there  
12 that have maybe 60 gallon equivalents per day. This one has  
13 essentially a 100 gallon equivalent per hour opportunity.

14           And so you can see that, you know, there's an  
15 opportunity here to penetrate the existing retail fueling  
16 infrastructure, at least the independents. And we're  
17 planning venues for that for the fourth quarter of this  
18 year.

19           When you look at regional development, this is  
20 what I was talking about, a Stage 3 area. There are 65  
21 stations in Greater Los Angeles area, public access, plus  
22 over 200 private stations. So there's a lot of vehicles out  
23 there that need fueling, and there's a public infrastructure  
24 plus a private infrastructure. There's an opportunity to  
25 grow regional trucking with this type of network. It can

1 support light-duty vehicles, we've been talking to  
2 European manufacturers about the same presentation that  
3 Honda presented this morning, which is, you know, we have  
4 stations where people live and we have stations where people  
5 work, and if you bring your European product in here, we can  
6 -- we can make this work. Also, California, with their 400  
7 stations, is the largest network, obviously, in -- in the  
8 U.S.

9           We've also expanded into heavy-duty trucking, and  
10 we're using the operations around the port and the drayage  
11 operations going from the ports to the Inland Empire to rail  
12 yards as the opportunity. We're building LNG stations on  
13 both ends. Then we are looking at quarters within  
14 California. [Inaudible] Associates years ago created the  
15 Interstate Clean Transportation Corridor. A lot of that's  
16 in place and ready to go, so north-south traffic, east-west  
17 traffic is -- is possible.

18           And also, we're working with a lot of truck  
19 manufacturers, truck -- trucking companies and -- and the  
20 truck stop market in locating LNG facilities so that we can  
21 branch out from the ports in our regional trucking and  
22 everything and actually start penetrating east-west and all  
23 the way coast to coast.

24           The incentives for vehicle purchases, I think, are  
25 more important than incentives for building stations. If

1 you look at some of the best DOE Clean Cities grants, they  
2 ask for a lot of money for a lot of vehicles and -- and also  
3 for the station, but, you know, I maintain if you get an  
4 order for a lot of vehicles that you could -- that you could  
5 -- anybody in this room that is in the fueling business will  
6 -- will gladly provide a fuel station and fuel savings to  
7 the customer.

8           So the lion's share of Clean Cities grants are for  
9 vehicles, not stations, although there are key stations in  
10 some of those areas that are Stage 1 or Stage 2 areas where  
11 we're just trying to get going. I would recommend that  
12 probably half of the station funding allocation be switched  
13 to vehicle allocations or at least be specifically tied to  
14 vehicle allocations.

15           And then I think this next one is a -- it's really  
16 not an R&D issue. We need some infrastructure funding to go  
17 towards developing best practices for maintenance facilities  
18 for CNG and LNG vehicles. We've done some of this in the  
19 past for CNG vehicles, but the LNG vehicles create some new  
20 issues that have to be addressed, and we have some very  
21 sophisticated customers in the major trucking companies that  
22 need some hand holding here. And this is more of an  
23 engineering study to look at failure modes and best designs  
24 for -- for facilities for either new and/or retrofit.

25           So with that, I'll be glad to answer any

1 questions.

2 MR. OLSON: Thanks, Mike. Some really good  
3 information there. One of the things I'd like to ask about  
4 is station -- we've been approached by several entities, a  
5 lot of school districts, who installed -- made a choice to  
6 go to natural gas school buses and made an investment in  
7 fueling stations. And now we're 15 years later and  
8 there's -- it wasn't a good maintenance program apparently.  
9 And -- and in many cases, they -- they had -- had some  
10 success just from the fuel price differential using natural  
11 gas, but not enough money to keep this -- to keep things  
12 maintained and -- and so we set aside money specifically  
13 hoping that we'd see that kind of -- kind of project come  
14 forward.

15 What's your sense of -- of the need for that? And  
16 there was another question in there too, and some of these  
17 are behind the fence projects, not public access. And we  
18 keep hearing, well, for a specialized fleet or a -- that  
19 there really is -- you can't have a public access station.  
20 So I'd like to get your insights on that.

21 MR. EAVES: Well, we've been dealing with the  
22 school bus market, you know, forever. And we know that  
23 that's a -- a cash-strapped market. And if they -- if  
24 school districts any money, it doesn't go to -- doesn't go  
25 to the fleet services.

1           I would say that -- and CARB has done the same  
2   thing on their school bus replacement programs. They are  
3   special and probably deserve some -- some type of  
4   assistance. But I -- I think that if you did that, I would  
5   -- I would certainly tie it to -- to try to find a public  
6   access that could fit in there.

7           Some of them can, some of them can't. I would  
8   give higher priority to those who try to find, you know,  
9   ability to put in public access. Because that's what we  
10   need. We need more dots on the -- on the -- on the map, and  
11   we need dots, frankly, for anticipating consumer vehicles  
12   that will come into the market. They're going to be in the  
13   same -- same locations as these -- as some of these school  
14   districts.

15          So -- so for school districts, I can probably  
16   definitely see that. But other city and municipal type  
17   fleets have just neglected their -- you know, their systems  
18   for so many years, I'd be reluctant to do that.

19          MR. OLSON: Let me ask, your comparison of January  
20   2007 to today and the kind of number of vehicles per  
21   station. A couple years ago, we talked about should we put  
22   more money into fueling stations if they're not at full  
23   capacity. And does this mean in this two-year period that  
24   the capacity use has gone up or is there still an issue  
25   of --

1           MR. EAVES: No, I think there's -- I think we're  
2 just starting to get bigger, larger stations. You know, if  
3 you look at that, if you look at our module, it's 1000 SCFM,  
4 that's equivalent to about 11,000 gallons a day, you know,  
5 fueling capacity. You can't utilize that because your fuel  
6 window is never that large. You know, where you're queued  
7 up 24 hours a day. But capacity is up. I don't think we're  
8 running out of capacity. We're actually -- you know, we've  
9 actually seen stations being cleaned out and new hardware  
10 put in with much, much larger capacity. So I think we're  
11 still rich in capacity, and we still have capability to grow  
12 without necessarily building new stations.

13           Just like the hydrogen [inaudible], though, that  
14 has predetermined that they want to see certain corridors,  
15 you know, with hydrogen fueling, you would look at deploying  
16 your dollars in that way. In other words, finding out  
17 where -- where the -- and that's just looking at a map and  
18 everything and finding out where the -- where the areas are  
19 not being served.

20           We had to do this in Los Angeles, where we had  
21 taxi fleets and we needed someplace between downtown L.A.  
22 and LAX to fuel. So we went out and we finally got a  
23 station in the Hollywood area, you know, to fill in the  
24 missing -- critical missing link. So I think it's got to  
25 be -- you have to look at it pretty strategic, but if it's a

1 station that's, you know, six blocks away from another  
2 station, no, I don't think so.

3 MR. OLSON: Let me -- let me ask about -- you gave  
4 this reference to European automakers. You have room to add  
5 100,000 vehicles to -- with existing station capacity. And  
6 you said that there are several interested. What would it  
7 take to get those automakers to bring their vehicles here?  
8 And is this also a bi-fuel type of vehicle?

9 MR. EAVES: Well, the Europeans are -- you know,  
10 I've sent several e-mails into the dark ether where I  
11 haven't had any response. But I've had two manufacturers,  
12 one in -- you know, I assured them that they wanted to first  
13 talk with you guys at the Energy Commission and get your  
14 support and go hand in hand to CARB. But, yes, they have  
15 bi-fuel vehicles, but they're -- they're willing to consider  
16 pony tanks. They're willing to consider ways that they can  
17 restrict their onboard fuel. They're willing to work  
18 towards dedicated within a couple years, but these would be  
19 vehicles that would be -- you know, how could they get  
20 support for a demonstration of a Euro 4 standard vehicle and  
21 could we waiver it and could we do 1000 vehicles as a demo,  
22 those are the kinds of issues that they are eager to talk to  
23 you about.

24 MR. OLSON: Yeah. My memory of Euro 4 was I think  
25 where CARB was in 1989, '90, somewhere.

1 MR. EAVES: Euro 4, Euro 5 -- Euro 5. I mean,  
2 but their carbon -- their carbon emissions are extremely  
3 low. These would be -- and these would be higher fuel  
4 economy type vehicles.

5 MR. OLSON: There is a -- there is a location in  
6 Northern California that we are trying to fill, and that's  
7 the closure of the [inaudible] plant, which I don't think  
8 there would be any single automaker interested in that, but  
9 there might be more than -- a mixture of more than one.

10 Let me also ask you about -- to what extent is  
11 your company looking at mixed fuel mixes like the  
12 [inaudible] HCG type of as an -- and in your stations do you  
13 sell diesel, gasoline, natural gas, or is it strictly  
14 natural gas?

15 MR. EAVES: The -- LAX, we sell CNG and we also  
16 sell hydrogen there in a demonstration program that we're  
17 doing with General Motors. At the -- at the truck facility  
18 on Anaheim and "I," we are selling diesel because we have  
19 HPI trucks that have diesel as a co-fuel. We have a  
20 [inaudible] demonstration in a trans site in Vancouver that  
21 can dispense anywhere from 100 percent CNG to 100 percent  
22 hydrogen in any combination blends in between.

23 We had a lot of interest about a year ago, and we  
24 talked with the fuel cell partnership, and they're trying to  
25 do some activities. We're trying to get engaged with GM



1 more on their fuel cell program and putting in more  
2 hydrogen because co-location with CNG stations is a natural.  
3 But the interest hydrogen side and fuel cell side is kind of  
4 waning a little bit.

5 I think -- in fact, we've just had some recent  
6 discussions with them in the last couple of weeks. Maybe  
7 we're going to resurrect that, but we will sell -- our  
8 station on Anaheim and "I" will also be dispensing CNG too.  
9 We'll make the CNG from the LNG. So we're open for a lot of  
10 different combinations.

11 MR. OLSON: And for your customers, is there a  
12 problem if you're fueling transit buses and passenger  
13 vehicles in the same -- same station? Is there --

14 MR. EAVES: The only one we have like that where  
15 we do that is at LAX, and we had to build a special  
16 dispenser for them and special priority panel to make sure  
17 they get -- they get fuel.

18 MR. OLSON: Is that mutually exclusive then?

19 MR. EAVES: What's that?

20 MR. OLSON: Is it mutually exclusive?

21 MR. EAVES: Yeah, but we have a lot of -- we have  
22 a lot of storage that we can still fuel light-duty vehicles  
23 very easy.

24 MR. WARD: We have a question on the WebEx. How  
25 fast if fast fueling?

1 MR. EAVES: As fast as you normally do with  
2 gasoline. You pull up and --

3 MR. WARD: Gas is eight gallons per minute.

4 MR. EAVES: What's that?

5 MR. WARD: Gasoline's about eight gallons per  
6 minute so --

7 MR. EAVES: Yeah, I mean you drive in and hook it  
8 up and fuel, put your credit card in, and you'll be gone in  
9 five minutes.

10 MR. WARD: Great. Thanks.

11 MS. BAROODY: Is that it? Thank you very much,  
12 Mike. Appreciate it.

13 Okay. Next up we'll have Herb Burnett with  
14 Burnett & Burnett.

15 We're just running a little behind schedule, so if  
16 we could possibly keep -- keep it to maybe 15.

17 MR. BURNETT: I'll stay within 15.

18 MS. BAROODY: Thanks.

19 MR. BURNETT: Because Mike covered a lot of areas  
20 that I was going to discuss.

21 MS. BAROODY: Great.

22 MR. BURNETT: First of all, my name is Herbert  
23 Burnett. I'm a consultant for alternative fuel industry.  
24 This is my 40th year of being in the fuels business, the  
25 first 22 with major oil companies, and then 10 doing -- I

1 started doing CNG with the Gas Company, and the last 13  
2 I've been consulting hydrogen, CNG, and LNG. And I want to  
3 thank the commission for allowing me to present.

4 As I go into the sunset of my career, I consider  
5 this to be a great opportunity to talk about our industry.

6 MR. WARD: You can't retire.

7 MR. BURNETT: I do want to say that I consider  
8 this to be a surge. This program is a surge. So -- in the  
9 real terms of a surge.

10 We started this program seriously in 1991, 1992,  
11 when the PAC funded some utilities to the tune of around  
12 \$350 million to jumpstart this market. And in doing so, we  
13 developed station criteria, and we invested in engine  
14 development, and we were modestly successful. And then in  
15 the late '90s there was EPAC and some other type of  
16 investments in other things, which I call the second stage.  
17 So I call this the third stage.

18 And so hopefully with this stage we can get to  
19 where we are sustainable, competitive, and transparent with  
20 the conventional fuels industry. So my presentation today  
21 is going to not follow a specific project but address the  
22 industry at large and my comments related to that. So I'm  
23 going to discuss CNG vehicle growth in the U.S. and  
24 California, infrastructure growth, throughput growth, and  
25 I'm going to talk about learning from mistakes via audits

1 and surveys because typically in private industry with  
2 these types of investments they say to do audits and surveys  
3 before they -- before you do a surge.

4           Then I'll talk about potential barriers, then  
5 market future, peak target areas, and believe me, I'm going  
6 to get there, I'm probably going to discuss my frustration  
7 with lack of development and success in the light duty. And  
8 then I'm going to talk about infrastructure cost with CNG  
9 energy, and unfortunate, it appears that in many cases some  
10 of these cost increases have really consumed the margins  
11 that we had hoped to make this business sustainable.

12           A lot of my data I pulled from the DOE alternative  
13 fuels website as well as other industry sites, but the key  
14 to this graph here is to show CNG starting in 1995 in terms  
15 of vehicles through 2006. It totals about 125,000. That's  
16 the dark -- that's the maroon color there. So basically the  
17 vehicle count has not dramatically increased. And much of  
18 that is heavy duty, primarily on the transit side.

19           The next slide shows the station count. And when  
20 you look at the CNG station count, as Mike's data showed,  
21 we've actually gone down because many of those smaller  
22 stations were not sustainable. They closed. And then also,  
23 we've been working on a definition of what is a station. A  
24 station is not something that's got four or five vehicles  
25 and a small 25 SCFM compressor. So we don't call that a

1 station.

2           The next slide I wanted to talk about is  
3 consumption. If you look at the consumption of CNG U.S.  
4 wide, it has outranked all of the other competitive fuels.  
5 Typically, it's been about eight to ten percent a year. So  
6 in terms of vehicles, according to my count, we're looking  
7 at about 150,000 vehicles. In terms of California, we came  
8 up with about 27,000 vehicles. And that growth has been  
9 about five percent a year.

10           In terms of LNG worldwide -- and I work with LNG  
11 vendors and manufacturers, and this is the source of my  
12 information here because there's very little DOE information  
13 on this. However, there's a couple of Energy Commission  
14 studies. But 5,000 worldwide and about 3,000 LNG in  
15 California.

16           In terms of market status, California fueling  
17 stations, this is -- as we see, it's 183. But when I  
18 actually talked to the utilities and looked at the websites,  
19 in terms of public, came up with about 183 -- 183 stations.  
20 And the LNG [inaudible] industry there's about 50 stations  
21 in California.

22           In terms of GGE for 2008, it's about 80 million  
23 GGE [inaudible] three major utilities in California.  
24 However, Southwest Gas does have a portion of California. I  
25 did include that. But the total is about 100 million GGE.

1 And this growth is about eight percent a year. When I  
2 left SoCal Gas in 1998, one of my tasks was to track this.  
3 And it was 57 -- 57 million tons, which is about, oh, 48, 49  
4 million. So it's doubled in about ten years. As I  
5 mentioned, 80 percent of this throughput is transit.

6 When we look at product available, and I'm going  
7 to comment about this later, there is not a great deal of  
8 CNG, LNG product vehicles available, and this is one of the  
9 challenges for the future. I think we all remember what  
10 happened in the mid '90s when the OEMs pulled out of the  
11 assembly line production when we had to rely on the  
12 [inaudible] and after market.

13 Market -- potential barriers. Lack of CNG, LNG  
14 vehicle product. There's only one medium duty engine from  
15 Cummins. ESI, in another presentation, they have an engine  
16 that's cert in 2010 and is a valid product. In terms of  
17 heavy duty, I'm thinking 350 and above. But as I talk to a  
18 lot of these heavy duty fleets, one of the things they  
19 complain about on CNG and LNG is that they don't have enough  
20 power. And you hear it over and over again that we want  
21 something that's 350 horse and above.

22 For school buses, for years -- for about seven  
23 years, we had the Deere engine, which was great and was  
24 about 500 school buses running [inaudible] California CNG.  
25 There's no engines for school buses except the EMI bus that

1 we hope to get once the CHP approves that. But there is a  
2 propane bus available.

3 And there's only one light duty OEM product, and  
4 there's a high cost to update. And the reason I say that is  
5 I have a CNG vehicle. I bought a second one, and it was  
6 pre-owned from a transit. And it cost me \$7000 to get the  
7 tanks replaced. So we've got a lot of work to do to -- to  
8 work on cost.

9 Market particular barriers, excessive vehicle  
10 cost, infrastructure schedules. One of the things when a  
11 customer looks at an alternative fuel program, he  
12 [inaudible] vehicles, incremental cost. You have to look at  
13 the stations, and you have to look at garage modifications.  
14 A lot of those folks have garages, and most of them are not  
15 compatible for CNG. From \$250- to \$500,000 have to be spent  
16 on garages. The AQMD and other funding agencies now include  
17 garages as part of their funding programs for these.

18 Next is the [inaudible] implement an alternative  
19 fuel program. The CUPC process. We have been partially  
20 successful in getting categorically exemptions [inaudible]  
21 the public hearing, but then [inaudible] declaration or the  
22 EIR, you add a year and you probably add a couple hundred  
23 thousand dollars onto the project. There's no reason  
24 anywhere in California why an alternative fuel project  
25 should not be categorically exempt.

1           Delivery time for [inaudible] and large  
2 compressors, we've got to work on that. In some cases it's  
3 12 to 16 months. We also have to look at what happens if we  
4 lose additional fuel price margin if the federal highway and  
5 energy bills are not extended. We all know about the bills  
6 that are coming up, but with the state of our nation in  
7 terms of its budget and all of the initiatives that we're  
8 going to be funding in the state of California, you can see  
9 it already, at some point, this industry is going to have to  
10 stand on its own. But right now that 50 cents a gallon  
11 [inaudible]. We need to keep that if we're going to keep  
12 this moving.

13           And we need to validate that an alternative fuel  
14 program is competitive with conventional fuels based on  
15 lifecycle -- lifecycle cost. A lot of my customers are  
16 asking for lifecycle costs compared between LNG and CNG.  
17 They want to know the maintenance, they want to know the  
18 garage costs, and only then will they commit, looking at  
19 over ten years as to whether or not it's competitive with  
20 gasoline and diesel.

21           Target locations for investment. On existing  
22 stations, we've got to focus on those. You can eliminate 30  
23 percent of site investment costs. I don't know if you know  
24 it or not, but when you go to a grassroots site and you have  
25 to put in paving, the lighting, street improvements, you can



1 add as much as 30 percent to the site costs. So what I'm  
2 saying is look at existing stations first.

3 After an audit of existing propane, CNG, and LNG  
4 stations, upgrade to meet peak demand. In the interest of  
5 time, I'm not going to go through and cite locations, but  
6 there's several locations where these stations are doing  
7 great but they don't have the money to upgrade to handle the  
8 peak loads, which is usually 7:00 to 9:00 and 3:00 to 5:00.

9 Replace compressors and dispensers at existing  
10 high-frequency locations that are greater than [inaudible]  
11 years old. When maintenance costs skyrocket, center's not  
12 reliable. Fleets pull in and there's no fuel, and we can't  
13 get people to buy new CNG vehicles and fleets to commit if  
14 there's no fuel or it's not reliable.

15 Add other alternative fuels at high-input,  
16 single-alternative fuel, 24-hour stations with good access.  
17 So some stations that just have CNG, add LNG. For stations  
18 that are LNG right now, we add CNG.

19 Add CNG to existing gasoline and diesel service  
20 stations. In our initial programs back in the '90s, we did  
21 get several companies -- Shell, Unocal -- to add CNG at the  
22 off island. However, we could not meet the throughput  
23 commitments, and they kicked us out after a few years. We  
24 couldn't sustain it.

25 Number 2, new alternative fuel stations. And I am

1 suggesting we look at [inaudible]. And fuel access must  
2 be transparent to gasoline and diesel, locate in existing  
3 truck stops and car lots -- truck stops like -- and car lots  
4 like Pacific Pride, Travel America, Shell, and the other  
5 major companies. Focus on high volume fleets such as street  
6 sweepers, short-haul trucking, refuse, and port. These  
7 stations must have alternatives. [Inaudible] stations  
8 should have multiple alternative fuels.

9           The photo there is on Consolidated Disposal  
10 Service, which is located near five major freeways in North  
11 Long Beach. It just opened in August, and it's got 200  
12 refuse trucks, of which 50 already are on LNG, and it's a  
13 public station. And it's an ideal location for ports, so I  
14 say this is an existing facility that's going to grow where  
15 you might want to find -- add an additional tank, some  
16 additional dispensers.

17           This is an example of a port area truck stop where  
18 there are 16 trucks putting in gasoline and diesel, where  
19 you can add CNG and LNG at these sites. I talked --  
20 personally talked to a lot of these drivers. The  
21 competition is fierce in terms of a daily rates. And they  
22 look not only for [inaudible] on the rate, but they also  
23 look at fuel price. Market and fuel price means a lot to  
24 them. So this would be an investment location that I would  
25 ask you to take a look at.

1           This is an example of upgrading an existing  
2   quality municipal site. There are so many municipal sites,  
3   I don't mean to discriminate on a lot of the sites. But for  
4   example, Riverside, Ontario, this is Inglewood, where they  
5   are in prime locations, the throughput is high. So this  
6   would be a site where you would look at in increasing the  
7   size of the facility as well as adding other alternative  
8   fuels. But certainly these municipal sites have a great  
9   deal of value.

10           This is another locations where you -- location.  
11   I looked at this last year. We looked at ethanol and  
12   biodiesel stations. We call them [inaudible] sites. And  
13   this is Conserve Fuel in West L.A., and this is a prime site  
14   to add CNG. There's a lot of interest there. There's about  
15   four or five of these in the state that you might want to  
16   consider adding additional fuels.

17           Now, on cost comparison. This is the most  
18   important thing I want to talk about because this is where  
19   the -- this is where the rubber meets the road. And we  
20   don't meet this criteria, we're not going anywhere.

21           What I did was to put together a little table  
22   showing what the components are going to cost, and I talked  
23   to some of my oil company friends in order to get some  
24   regular unleaded, and -- and diesel costs. But I put this  
25   together to compare, on the right side, the total -- there

1 is about a 60 cent margin -- if you own a station, a 60  
2 cent margin with diesel and about a 50 cent margin with  
3 regular unleaded gasoline.

4 So if -- at the prices that we're talking  
5 about -- oh, by the way, I used \$64.00 a barrel, which a  
6 buck-fifty a gallon, for crude, and I used 70 cents  
7 [inaudible] for natural gas. But we've got to maintain our  
8 margin if we want to convince folks to go with alternative  
9 fuel.

10 This chart here shows the differential between LNG  
11 and -- the historical difference, which is about 50 cents --  
12 50 to 60 cents a gallon. We need to maintain that.

13 In terms of infrastructure cost on stations -- and  
14 this is the most disappointing thing that I want to talk  
15 about because over the years we fought hard to get this  
16 price down, but we have not been successful. These prices  
17 have been going up about ten percent a year.

18 For a school district station, which is typically  
19 30 to 40 [inaudible]. You're talking about \$600,000.  
20 That's been the average of about 20 projects that I've done.  
21 Heavy duty vehicles [inaudible] facility, you're talking  
22 about 2 million [inaudible], 25 million bucks, and that's  
23 for a couple of twin 1000 compressors of LNG and that was  
24 typical for every consolidated disposal service which has a  
25 20,000 gallon tank and dual dispensers.

1           And for heavy -- a heavy -- a medium to heavy  
2 duty station, you're talking about 6 million and 7.5. And  
3 then this is a public similar to the -- to the Inglewood  
4 site, you're talking a million and a half. If you  
5 [inaudible] LNG, you're talking 1.2. And a utility, like  
6 SoCal Gas or PG&E, with a public, you're talking 1.3. And  
7 as I mentioned, the price is rising about ten percent a  
8 year.

9           And this is my final slide, and this is my  
10 recommendations I'd like to make on the implementation of  
11 this spending program. And that is to focus on the heavy  
12 duty market because this is where we get the throughput, the  
13 high utilization vehicles, and the high consumption  
14 vehicles, and they can [inaudible] as long as you have a  
15 reasonable margin. And believe me, these fleets, in this  
16 day and age, they're definitely looking at economics.

17           Audit, survey existing stations. Those stations  
18 are underutilized. And I can't emphasize that enough. I  
19 would say about a third of the public stations out there  
20 now, a third to half, are underutilized. We need to put  
21 vehicles at those stations.

22           Upgrade existing profitable CNG stations to meet  
23 the peak loads and add alternative fuels. One thing I did  
24 miss when I went through -- oh, here it is, I'm sorry.  
25 Allocate a minimum of 25 percent of the first year money

1 funding to engine development and to help -- and to  
2 subsidizing engine costs. We've got to get more vehicles at  
3 the stations.

4           Number 5, minimize private access stations unless  
5 throughput meets some specific stringent investment and  
6 environmental criteria. The exception to that is the school  
7 districts. I work with probably about 40 school districts,  
8 and the big concern with them is they do not want to do  
9 public, but when you look at all the funding available, they  
10 can -- they can virtually do a project with no monies of  
11 their own. But the problem is right now they don't have an  
12 engine besides -- and the propane is the only fuel.

13           And finally, minimize grassroots station  
14 installations where site development cost is 30 percent of  
15 the total cost. That's one of the major mistakes we made in  
16 some of the earlier phases. This ends my presentation. Any  
17 questions?

18           MS. BAROODY: Thanks, Herb.

19           MR. OLSON: Very good. Thanks a lot. That's good  
20 information there. I'm wondering if you have any -- I want  
21 to -- given your career -- part of your career was with  
22 Southern California Gas Company, there is discussion now for  
23 the utilities, and this discussion is occurring in the  
24 Public Utilities Commission, utilities again having some  
25 role. Not only in natural gas, but also electric drive, and

1 do you see anything there that -- that you have a comment  
2 on?

3 MR. BURNETT: Yes. Utilities should be part of  
4 this surge. The way I see it, Tim, the 17 years that we had  
5 to get competitive, we need everything we can to make this  
6 thing work. And I would say if any part of that can help  
7 achieve some of these goals that I've put up here in the  
8 short term, in the next couple years, that allow us to be  
9 sustainable and competitive, I say yes. As long as it  
10 doesn't interfere with some -- with some project investment  
11 that's already in place. So if that was targeted, for  
12 example, and didn't compete with firms who are already in  
13 business, then that's fine.

14 MR. OLSON: Well, one of the areas would be the  
15 home refueling possibility.

16 MR. BURNETT: I've -- I have to make a "no  
17 comment" on that one. I remember the [inaudible] standards.  
18 And there was a home refueling section in there, and I -- I  
19 have not done any home refueling. And with that, I can't  
20 say any more. I have not done any home refueling projects.

21 MR. OLSON: Okay. Very good. Thanks. Oh, I just  
22 want to ask one other question. I can't remember offhand  
23 whether you were on our contract team, the Tetrotech  
24 contract team.

25 MR. BURNETT: Yes, I am.

1           MR. OLSON: Okay. So that -- we may be talking  
2 to you about the audit idea.

3           MR. BURNETT: Oh, great. I'd be glad to, because  
4 the audit [inaudible] the three-quarter million that we got  
5 is very important. Because we can't make the same mistakes  
6 we made before. And you've got to do some field work to  
7 find out what works and what hasn't been working.

8           MR. WARD: Thank you, Mr. Burnett. I hope you'll  
9 be able to testify at the -- at the [inaudible] regarding  
10 [inaudible], and maybe you can add your wealth of experience  
11 to the testimony there.

12           MR. BURNETT: Anything I can do to help. The  
13 original Gas Company pilots, way back in '92, '93, I was  
14 involved in those. And that -- and certainly, even though  
15 you might question the overall success, the utilities did  
16 jumpstart it to get it started, because we had virtually  
17 nothing in California in '92. So -- and I can say we -- we  
18 need everybody pulling together now if we're going to get to  
19 this sustainable position.

20           We cannot be funding stations in two years, later  
21 there's no load on the station. The station's shut down,  
22 and now you've got an idle investment. That's -- that's  
23 horrible. And we -- we made those kind of mistakes. And  
24 that's why I've taken the drastic approach that I'm sure a  
25 lot of people don't agree with, but I've taken the drastic



1 approach of let's go after the large consumers and the  
2 heavy duty vehicles, and let's put them at locations where  
3 gasoline and diesel is right now, where it's transparent.  
4 And so that's my -- that's my current way I look at things.

5 MR. WARD: You've been involved in all sides of  
6 this. We can benefit from your testimony --

7 MR. BURNETT: Thank you, sir.

8 MR. WARD: -- and having you go there. Thank you.

9 Next presenter is Mr. Bill Zobel, now with  
10 Trillium.

11 MR. ZOBEL: Good afternoon. Thanks for having me.  
12 Nice to be here in my new role that I've had for about a  
13 week and a half. So it's exciting to be here and part of  
14 the -- the presentations today. I think Herb and -- both  
15 Herb and Mike covered an awful lot of ground. I don't want  
16 to be intensely repetitive here, but I've got a couple  
17 things I want to share, and then if we have some time for  
18 questions afterwards, happy to share from experience prior  
19 to this job as well if you'd like, so we can get into that.

20 There we go. Just a little bit about the company.  
21 This is our one-page advertisement. We design, build, and  
22 operate high capacity CNG stations. That's been our market.  
23 We've got national fuel available with operation hubs  
24 primarily in Los Angeles, Orange County, and New York City  
25 currently. All of that market is growing. We dispense

1 about 35 million gallons of compressed natural gas  
2 annually. That rate's growing about ten percent a year, and  
3 we have a significant California presence, which is also  
4 growing.

5 I'm going to coin a new phrase today. We'll call  
6 it Boyd's Law for Alternative Fuels. Okay. You can take  
7 this back with you, show the commissioner. And it's  
8 really -- the commissioner does a lot of talking about  
9 alternative fuels and what makes it successful. He calls it  
10 a three-legged stool. Being the engineer that I am, I  
11 wanted to put it into a formula with an equal sign in it, so  
12 you've got your policy plus your incentives. You've got  
13 your infrastructure, plus you've got your vehicles. And  
14 that equals success.

15 And success, I think, in this regard is market  
16 transformation. And how do we transform this market from  
17 where it is today, which was -- I think we've seen the  
18 statistics with CNG capacity and LNG capacity about five  
19 percent of the port market, for example. We'd like to see  
20 that be 50 percent or better, if we can.

21 So really, combining all three of these elements  
22 is necessary for successful market transition. That would  
23 be policy incentives, infrastructure, and vehicles coming  
24 together.

25 So starting with policy and incentives, clearly

1 the policy is there. We've got AB 32, the low carbon fuel  
2 standard, AB 118, which is what we're here to talk about  
3 today. There's federal stimulus. All kinds of other  
4 programs out there to try and push this. But as Herb  
5 described, you know, we've been at this for 17 years and  
6 we're really -- you know, there's been a couple of swells  
7 there, but nothing that's put it over the top. So maybe  
8 this is the chance we have to put this thing over the top  
9 with all these people coming together.

10 Now, these incentives are important. Okay. They  
11 can drive customer value, and if we accurately place these  
12 things -- I think everybody's talked today about, you know,  
13 their thoughts on where to accurately place incentives --  
14 then we stand a chance to move the market in the right areas  
15 and that right direction. What you really want to do is  
16 make it a no-brainer for customers. That's -- that's where  
17 we're all headed. If the customers are behind it, it will  
18 certainly happen.

19 On the vehicle side, a lot folks talked about  
20 vehicles today. They were knowledgeable folks who've been  
21 in the business for a long time. There are a whole host of  
22 vehicles that fall into those three classes. There's also  
23 product RD&D, which has been discussed at length today in  
24 terms of what's necessary to open up new markets and new  
25 engine sizes in the natural gas area. And then CARB

1 certification is certainly an issue that we'd like to take  
2 on in some way, shape, or form to try to get more vehicles  
3 onto the marketplace sooner.

4           So vehicle incentives are key to moving the market  
5 forward. I think Mike touched on it a little bit. It's one  
6 of the most important things to move it forward. If you get  
7 the right application and the right fleet with vehicles, the  
8 infrastructure will follow. I mean there are certainly  
9 enough margins there for infrastructure for customers to put  
10 these things in. There's a driver on the fuel side, but  
11 that up-front cost is a real show stopper for a lot of  
12 fleets, especially small ones that can't afford to amortize  
13 these things over larger fleets and over a longer period of  
14 time.

15           So to the degree which we can help the vehicle  
16 side bring new product to market, provide incentives for the  
17 high up-front costs of those vehicles, anything we can do on  
18 certification and bring down the cost of tanks and other  
19 equipment systems would certainly be helpful.

20           On the infrastructure side, we've heard -- I  
21 thought Mike gave an excellent presentation about the  
22 business. We look at it much the same way, although our  
23 proposition is a bit different. But infrastructure  
24 incentives can add considerably to the proposition.

25           You know, we've talked a little bit about -- I

1 think Tim asked the question to both the previous  
2 presenters on this panel about this public-private  
3 combination. You know, how does that work? Herb's got a  
4 little more experience than anybody in that area in terms of  
5 who wants it, who doesn't want it, but there are people out  
6 there who will let this to go forward and who you will put  
7 in a CNG behind a gate, if you want to call it that,  
8 station. [Inaudible] let you, you know, put a public pump  
9 on the street.

10           So -- and finding those people will help  
11 facilitate the availability of more dots on the map that  
12 Mike was talking about to give people an additional  
13 opportunity to -- to fuel. One of the things I didn't get  
14 into that I thought about when I was sitting down, and  
15 [inaudible] and I had talked about this before, the CNG we  
16 see -- you know, one of the ways people find things these  
17 days is on these GPS's. Right? A lot of folks have these  
18 little portable GPS's. If we can get these alt fuel  
19 stations -- in particular CNG and LNG -- on the GPS systems  
20 so they pop up, you know, people don't have to plan their  
21 trips on the Internet and their computer at home before they  
22 actually go on them. You can just use your system to move  
23 forward.

24           So that might be something that, you know, we  
25 could use some of this money for is to get that set up and

1 head down that path or provide people in their vehicle  
2 access to these stations [inaudible] if they really need it.

3 Aging infrastructure. That's been talked about a  
4 little bit today. I think that's a key area. But you need  
5 to look at that very closely. You know, there are good  
6 locations and there are bad locations. There's good  
7 infrastructure and bad infrastructure. And you've got to --  
8 you know, I think on a case-by-case basis you need to look  
9 at this and decide, you know, where do you want to invest  
10 your money? Is this a good site? Is it something we should  
11 try to upgrade? You know, can we use some of the equipment  
12 we already have? There's a lot to be said for already  
13 having utilities in place. And if you just drop in a new  
14 compressor or maybe a new dispenser, that's -- that's  
15 cheaper than having to do a Greenfield site that Herb talked  
16 about where things get very, very expensive very quickly.

17 So the degree to which we can find these sites  
18 that are, you know, good locations, if you will, that would  
19 be a real opportunity, I think, for all of us to move  
20 forward in this space. So, you know, we've talked a lot  
21 about how volume sort of drives the infrastructure side of  
22 the business. You need to have a station that's either  
23 profitable out of the gate or gets profitable. There's a  
24 lot of different ways to do it. Different operators have  
25 different philosophies on how to do it. There's public

1 retail, private fleet, or combination of the two that can  
2 all help -- help move the market forward.

3           You've seen several slides on price comparisons,  
4 and if you -- this is just a quick comparison on public  
5 pricing for the retail stations we have in the area. We do  
6 a pretty good job, I think, of beating the diesel price. I  
7 thought Herb's chart did a pretty good job of laying that  
8 out as well, and that's consistent across the board.

9           Then if you look at really station sizing versus  
10 the cost to the customer, the bigger station, the lower cost  
11 you're able to provide the customer. What you're really  
12 doing is you're spreading your fixed costs and your  
13 [inaudible] costs over a larger number of gallons. That  
14 brings that cost down and allows these -- these stations to  
15 go in at a much more attractive price on fuel for the  
16 customer.

17           So, you know, when you look at this kind of a  
18 chart and you say, okay, let's start combining this stuff,  
19 how does that work? You know, can you give some customers  
20 fuel cards, do you give them discounts if they agree to buy  
21 a certain amount of volume over the course of a year? How  
22 does that help drive station development and move  
23 infrastructure providers toward spending, you know, what  
24 might be anywhere from half a million to \$1.5 million for  
25 what might be an average sized station to serve a reasonable

1 area?

2           So infrastructure considerations, many of these  
3 have been -- have already been covered today. For the  
4 private fleet it's -- you know, it's a large up-front  
5 investment. There's a lot of money they're putting forward  
6 for these stations. They want to make sure that they've  
7 done their homework and have this all penciled out. They're  
8 typically designed for specific applications.

9           The public retail option is certainly a given that  
10 should be considered. In fact, we just had a contract that  
11 was accepted with a large transit agency down in San Diego  
12 where we had thrown out a public option and they didn't want  
13 to do it. It was in there, but they said, ah, you know,  
14 just too much trouble, too much liability. And I think give  
15 us some more time we can work through those issues,  
16 especially with -- you know, where agencies are putting in  
17 these kinds of systems. You know, we can work through  
18 putting something on the street that minimizes liability and  
19 allows for -- for additional public access.

20           You have considerations if you're doing a lease.  
21 How do you get your own [inaudible] set up? Do you do it  
22 yourself? Do you pay somebody to do it? All these kinds of  
23 things.

24           On the retail side, you're going to pay retail  
25 market rates. And in most cases, they're considerably



1 higher than what you would pay if you put something behind  
2 the gate and you have some considerable volume. There are  
3 some sites out there that I'm sure you're all familiar with;  
4 cngshop.com allows you to go -- come see prices. While  
5 these aren't official prices, you know, the people that use  
6 these stations actually go in and update these. You can see  
7 across, you know, broad regions of the country how much  
8 people are charging at these stations that are public, and  
9 there are some private stations in there as well, which  
10 really don't help the public folks. But we can look at the  
11 public retail stations and see how pricing patterns are set  
12 up across the region, which we'll see is additional  
13 competition and drive down prices.

14           One of the things we're going to try to do is a  
15 case study in a region that we do business that shows, you  
16 know, kind of how that has worked and the benefits of it  
17 being there for the public.

18           Benefits -- it also benefits the retail customer  
19 because there's no up-front infrastructure cost for them.  
20 They don't pay anything. They just buy the vehicle and they  
21 go up and they -- and they use the sites. They're not  
22 saddled with the high cost of infrastructure.

23           In terms of providers, again a lot of this  
24 information has been touched on by previous speakers, and I  
25 know we're pressed for time, so I'll try to move through

1 this pretty quickly. We're in the business to build  
2 stations for customers, support [inaudible] for refueling.  
3 That includes equipment, construction, operations, and  
4 maintenance. That is -- that is what we do.

5           There's contract build. There's building on spec.  
6 Different providers, like I said, have different  
7 philosophies on how and whether to do that and where. And  
8 then you can add your [inaudible] to that too if you want to  
9 as a provider. The gas market is deregulated, and you have  
10 that option. It's a risky value proposition, but it can be  
11 done. It can be done.

12           In conclusion, it's really all about following  
13 Boyd's Law. That's what -- that's what we want to do. Now,  
14 just for clarity, don't look at Boyd's Law on the Internet.  
15 I googled it; right? But it has to do with social  
16 networking. It's a completely different thing, so this  
17 Boyd's Law for Alternative Fuels. It's different from --

18           MR. OLSON: It's now -- it's probably now on the  
19 website.

20           MR. MR. ZOBEL: Boyd's Law for Alternative Fuels.  
21 That will be good. Anyway, so in conclusion, it's -- you  
22 know, drive this money down to infrastructure and to  
23 vehicles. And if it's a large enough application, if you  
24 fund the vehicles, the infrastructure will follow. It's  
25 essentially a no-brainer when you go into CNG applications

1 for customers. It's a very good opportunity for them  
2 given the fact that they have money available for -- for  
3 trucks.

4 I would echo Herb's comments that, you know, heavy  
5 duty applications are certainly worth putting more of these  
6 dots on the map. The heavy duty applications have a good  
7 number of products. They need more. The medium duty market  
8 needs to grow. We need to get more product, more engines,  
9 in the medium duty market and particularly in the very near  
10 term because some of these things are phasing out.

11 Dwight, from Cummins, today touched on, you know,  
12 the phase-out of the V series mold, which was good. It was  
13 a good size. It was right in there, and it was a natural  
14 gas application. We need to fill that void. That's an  
15 important void to fill for commercial business. They like  
16 that engine class, so getting after that, I think, will be  
17 very important.

18 So an effective deployment of this capital can  
19 really leverage this market transition in all the areas  
20 we've talked about today. It can help meet the very  
21 aggressive goals of the State of California, which we  
22 support 100 percent, and then drive this market  
23 transformation. So thank you, and I'd be happy to answer  
24 any questions.

25 MS. BAROODY: Thanks, Bill.

1           MR. OLSON: Yeah, I have a couple questions on -  
2 - on cost. If you remember in our AB 1007 [inaudible], we  
3 tried to make a -- we tried to look at lifecycle cost by  
4 adding the cost of -- cost of the consumer in terms of the  
5 cost of the infrastructure as -- as included in the fuel  
6 cost and the cost of the vehicle. So in my mind, those are  
7 the two things that the customer's looking at. What's this  
8 going to cost me in terms of buying the vehicle, and then  
9 what's the operating cost, the fuel operating cost?

10           And my memory of this is -- and this had feedback  
11 from a lot of companies -- was that around -- the natural  
12 gas is priced around \$3.00, equal to or even greater than  
13 this, \$3.50 a gallon gasoline, or around \$4.00 diesel. And  
14 natural gas starts competing real well when you look at that  
15 sort of lifecycle. And my question is -- well, the question  
16 of where are fuel prices going, that may -- everything  
17 jumbling up, but we may see some periods where it goes down  
18 again, and it's kind of volatile. Any -- any part of that  
19 cost stream where -- where you see reductions where you'll  
20 get to the point where that natural gas total lifecycle is  
21 beating or better than gasoline or diesel?

22           MR. ZOBEL: Yeah, I think so, but I look at it  
23 from a little different perspective. Let's look at the  
24 value chain and start with supply. There's all kinds of  
25 supply. I don't need to tell you guys. You do the State

1 forecast on supply. You know that there is a tremendous  
2 amount of natural gas out there in the Lower 48. There's a  
3 huge amount of gas in Alaska that's eventually going to get  
4 piped down here. There are LNG terminals that help bring in  
5 gas despite the fact that you really can't pull out propane.  
6 [Inaudible.] We can talk about that.

7 But all of these things, you know, are driving to  
8 the conclusion that natural gas is here. It's going to be  
9 around for a long time. There are a lot of downward  
10 pressure -- a lot of downward pressure points on natural gas  
11 to keep that price. But I think on the other side of the  
12 spectrum, for petroleum fuels, traditional petroleum fuels  
13 where we import a large percentage of our feedstock to make  
14 those fuels, we see those costs going up. Everybody see  
15 those -- sees those costs going up. There's very little to  
16 show that the prices are going to drop.

17 Will we see a dollar -- \$150 per barrel oil again?  
18 I -- you know, I don't know. I would think so at some  
19 point. But, you know, how long before oil crosses the \$100  
20 barrier again and, you know, we start dealing with gasoline  
21 that's 4 bucks? With -- so with that, coupled with the fact  
22 that we're spending gas -- you're going to have more gas  
23 coming on stream that will keep natural gas prices low and  
24 will continue to -- to provide that value proposition for  
25 the customer in terms of the lower incremental costs per

1 gasoline gallon equivalent for the fuel.

2           On the vehicle side, I think what we're seeing is  
3 the vehicle costs are increasing for alternative fuel  
4 vehicles. And there are -- there's many reasons for that as  
5 there are components on the vehicle. You know, a lot of it  
6 has to do with volume. Some of the speakers this morning  
7 articulated very well, I thought, about how, you know,  
8 volume helps drive down some of these costs, and that's  
9 really what we need here.

10           So workshops like this, I think, are key in  
11 identifying ways we need to, you know, kind of put up public  
12 policy for this and get these things going. And the degree  
13 to which I think you can bring volume to the vehicle side,  
14 you can continue to try and put downward pressure on those  
15 prices as well. But in the near term, you know, we see the  
16 vehicle prices kind of going up.

17           That said, I don't think at any point in the --  
18 in, say, the next -- if I say this I'll obviously be  
19 wrong -- next five to ten years, that you'll see, you know,  
20 kind of natural gas prices escalate to a level where they  
21 equate to petroleum fuels. And you'll -- the differential  
22 will still be substantial and be able to continue so -- you  
23 know, I guess the short answer to your question is I think  
24 that margin will still be there for consumers to take  
25 advantage of and that as long as there's some structure and

1 product available for consumers to take advantage of that,  
2 they will do it.

3 MR. OLSON: Okay. Thanks a lot.

4 MS. BAROODY: Thanks a lot. Appreciate it.

5 All right. Now we'll move on to our biomethane  
6 panel, which was, oh, about -- we're about 15 minutes  
7 behind. So we have four speakers. We're adding on one more  
8 speaker to our agenda. That would be SoCal Gas, Ron  
9 Goodman. So Eric Montague from Prometheus -- Prometheus.

10 MR. MONTAGUE: I'll be quick.

11 MS. BAROODY: Okay. Great. Thanks.

12 MR. MONTAGUE: Great. Thank you for having me  
13 here today. I'm filling in for Dr. John Barclay, who opted  
14 for a sunny cruise over speaking at this conference -- or  
15 this workshop.

16 I'll take a few minutes and just kind of go over  
17 basically -- my agenda here is to let you know what we're up  
18 to, what we've been doing here in the state of California in  
19 biomethane and where we think it's going, and particularly  
20 what we think the CEC could do to help promote biomethane as  
21 a viable -- or one of the viable solutions.

22 Our business model is relatively simple. We look  
23 for stranded or remote gas sources, stranded for a number of  
24 reasons, and biomethane falls into that category whether  
25 that is digester gas, landfill gas, coal mine methane, other

1 particular off-spec gas.

2           We were founded basically on a technology basis --  
3 technology and R&D development, and that's our sweet spot in  
4 the middle there, basically designing and building  
5 purification liquefaction systems on the smaller distributed  
6 scale. From that point, we clean up the gas that we bring  
7 in, liquefy it to get it cold enough to turn into liquid  
8 natural gas, and then we move it to the market via  
9 over-the-road tankers. That market in California is  
10 primarily vehicle fuel, but there are other niche markets  
11 out there, from industrial usage, remote off-code  
12 communities, and utility demand for peak shaving.

13           Biomethane has been around for quite some time,  
14 landfill gas projects. You know, there's a number of  
15 projects across the world really where they have utilized  
16 that gas in various forms, the option commonly referred to  
17 as medium or high BTU projects. There's none of those high  
18 BTU projects here in the state of California, but they are  
19 pretty common elsewhere.

20           Digester gas is something that's been gaining  
21 traction lately in the last few years, particularly here in  
22 California where there are -- is a fair [inaudible] culture  
23 activity, and it's a potential large source. And then  
24 wastewater treatment's another potential source of  
25 biomethane or biogas.



1           In our case, we focus on the production of  
2 bio-LNG. The biomethane is used in various other aspects  
3 for use or pipeline injection in some cases. The LNG  
4 markets in the Western United States, biomethane plays a  
5 pretty small role today. We operate very -- the world's  
6 first commercial landfill gas to liquid natural gas facility  
7 down at the Frank R. Bowerman landfill. And it makes up  
8 less than one percent of the liquid natural gas productive  
9 capacity that could potentially supply, or does supply, the  
10 California markets.

11           A little bit more about this project. The  
12 Bowerman landfill is a very large landfill. I'm sure you're  
13 all aware of it. It's -- they, today, fill about 10 million  
14 cubic feet per day. We take a small slipstream of that and  
15 produce anywhere between 3- and 5000 gallons a day of liquid  
16 natural gas. The remaining gas currently is flared and is  
17 unutilized.

18           One of the challenges that you have with  
19 biomethane, or bio-LNG production, is that unlike  
20 traditional gas methane sources, biomethane typically can --  
21 very often is kind of a living, breathing animal in that the  
22 composition of the gas can change wildly in a very short  
23 amount of time. And that creates some hurdles as far as the  
24 purification of that -- the purification of that resource  
25 goes.

1           Basically, we tackle that effectively here in  
2 California. Now we produce, say, a vehicle grade liquid  
3 natural gas that is 97 percent plus methane with all the  
4 nasties, as we call them, cleaned out and keeping those out  
5 of the value chain.

6           A couple more pictures of that facility. It has a  
7 30,000 LNG storage tank on site. It's -- the primary driver  
8 of that facility is a -- a one-megawatt landfill  
9 gas-driven engine. And we take a load out of there roughly  
10 every other day, every three days, and send that to market.  
11 That fuel right now goes to a handful of customers in  
12 Southern California. One particularly is a refuse hauling  
13 fleet that runs trucks actually back to this landfill and  
14 dumps trash here that in a few years turns into biogas,  
15 which we liquefy and sell back to them. So it's a nice  
16 closed-loop system that we're quite proud of.

17           A little history of this project. It was a bumpy  
18 road. There are a lot of challenges, given this is really  
19 the first time that this is done on this scale. We -- let's  
20 just say the commissioning phase was quite a bit longer than  
21 we had expected. Today, each one of these spikes here  
22 represents basically a load-out and that -- the graph on the  
23 bottom there is the volume of load-outs we were doing about  
24 a year ago. And the graph on the top there shows you that  
25 we've basically gotten this to an ongoing commercial and

1 feasible operations. We're taking load-outs regularly.

2 With operating a plant like this, you have the  
3 everyday logistics of moving fuel to market. We are a  
4 vertically integrated company in that we start from securing  
5 the gas source, contract for the raw gas, to the development  
6 of the plant and facility, ultimately to the sale of the  
7 fuel to the end user.

8 A couple of pictures of LNG being loaded, on the  
9 top there at the plant, and then taken to customers. So we  
10 supply primarily heavy duty LNG vehicles and then some CNG  
11 vehicles from this plant that operate on liquid compressed  
12 natural gas.

13 You can't see this here, but basically it's just a  
14 detailed testing analysis of the product quality. That has  
15 always been one of the historical concerns of bio-LNG is  
16 that you may not be able to get all the nasties out and it  
17 won't -- won't, long term, be an effective or efficient way  
18 of producing fuel. We're proving that that is a myth and  
19 that it can be done. Not without technical challenges, but  
20 here is a breakdown of a very -- what we consider a very  
21 clean product spec.

22 The big question I guess the CEC's trying to  
23 answer is: Where do we go from here? Bio-LNG and  
24 biomethane do definitely hold lots of promise for the  
25 future. It is really one of the truly green and low --

1 lowest lifecycle emissions fuels available, which has been  
2 proven by the AB -- the recent legislation, that gas coming  
3 from a landfill and offsetting -- offsetting petroleum --  
4 offsetting petroleum is kind of the double whammy that one  
5 of the gentlemen talked about earlier.

6           Now, that said, we completed this plant primarily  
7 through private funding, and there's lots of -- lots of risk  
8 associated with that. What we could eventually see  
9 ourselves doing is doing more of these types of plants in  
10 the future, but today, that would be stimulated greatly by  
11 some support from the CEC in additional funding to offset  
12 some of the risk with those facilities.

13           Two items I'd like to hit on here. Working in  
14 Southern California has been a unique experience for us. We  
15 have another plant, which our picture here, is in Moab,  
16 Utah, where to get a plant built and operating is much less  
17 of a headache than to do basically the same thing here in  
18 California. And that's primarily because of all the  
19 regulatory hurdles and permitting that you have to go  
20 through to do that, which, all other things equal, we will  
21 likely develop more of these plants outside of the state of  
22 California given that the cost is quite a bit less due to  
23 those hurdles associated with the regulations.

24           And second, the second part of this is just the  
25 general support, that large commercial scale liquid natural

1 gas facilities do have economies of scale that our -- that  
2 do compete with bio-LNG. And in the long run, as we  
3 continue to develop this technology, we become more and more  
4 competitive with those larger facilities. But stimulating  
5 the -- or eliminating some of the risks will help stimulate  
6 the second and third stages of these bio-LNG facilities,  
7 which ultimately will provide a more competitive source of  
8 fuel for customers and provide additional incentives to  
9 transition from petroleum-based fuels.

10 That's all I really have today, so I'm open for  
11 questions.

12 MR. WARD: At a later date, I would like to hear  
13 more from you directly on the hurdles that -- that  
14 California presents. We've heard this quite a bit, and we  
15 understand that they could be a bit of an impediment or  
16 barrier to further development of biomethane, other biofuels  
17 as well. We've identified in our Investment Plan some  
18 feasibility funding that maybe we could be helping and  
19 applying to that and just do more of an investigation to see  
20 how we can smooth out some of those impediments in the  
21 future.

22 I think it could make sense to do that first  
23 before any funding's really applied to this. Otherwise you  
24 bump up against that -- those hurdles that you knew existed  
25 prior to getting the funding. So I'd like to hear more from

1 you on specifically what those hurdles were and if it's  
2 regional in California or if it's -- I know the South Coast  
3 Air Quality Management District has had some difficulty  
4 approving source review facilities in general. I think that  
5 may exist to this day. But if it's more than just regional  
6 in California, California difficulties as well.

7 MR. MONTAGUE: Definitely. And then there's not  
8 enough time today to go through all that.

9 MR. WARD: Yeah.

10 MR. MONTAGUE: But to just give you a quick  
11 example of the facility down at the Bowerman landfill has  
12 that landfill gas turbine generator set there that basically  
13 set the best available control technology or is very close  
14 to it down in the region. And it was operating out of spec  
15 slightly, but it was out of spec from what the technology --  
16 or what our permit allowed there. So the solution for us  
17 was to bring in a statewide permitted rental diesel gen set,  
18 take the natural gas that would have fueled that gen set,  
19 flare it, and then run a diesel gen set right next door to  
20 it for a while, while we were going through some of these  
21 commissioning phases.

22 So an example of one of the things that are a very  
23 backwards approach to reducing emissions. That's just  
24 one -- one bit of a few -- handful of other stories there,  
25 the issues we continue to face in the ongoing operation of

1 the facility.

2 MR. WARD: I think it comes under  
3 counterintuitive. At least that's what comes to my mind  
4 when you're trying to do something much cleaner and then you  
5 have to bring in diesel to -- to get that completed. That  
6 is counterintuitive, I think. We would like to help, again,  
7 with that.

8 MR. MONTAGUE: Great.

9 MR. OLSON: Eric, a couple things that I think  
10 we'd like to talk to you about is the comparison cost-wise  
11 of these different business models to the extent you are  
12 willing to share that. And specifically looking at the  
13 variety of sources, landfill, wastewater treatment, dairy,  
14 organic source, and the extent the cost comparison of  
15 cleanup, whether you're putting -- whether creating LNG  
16 on -- at the site or cleanup to put it in a natural gas  
17 pipeline and whether -- and what that -- taking -- taking  
18 natural gas -- a real pipeline at some other point and  
19 creating LNG from that.

20 Those are things that we -- we want to look at  
21 closely, and I suspect that there are going to be some  
22 competing options there, but there may be room for a lot of  
23 things to -- to go forward. And we'd like to get some  
24 better information on that. I guess the question of  
25 cleanup, I don't know if you have time to really comment

1 now, is it different -- is it a different cleanup process  
2 when you're extracting out those impurities for a  
3 transportation fuel versus putting it into a natural gas  
4 pipeline?

5 MR. MONTAGUE: Yes. That last question, I'll  
6 take. Let me just say I'm open to answering any of these  
7 questions, time permitting here. I don't want to go over.  
8 But your last question, is it a different cleanup process,  
9 there are different considerations to take. When you're  
10 making liquid natural gas, one of the most important aspects  
11 of that process is clean out all of the water and CO2, any  
12 other constituents in the gas that will freeze up through  
13 the liquefaction process.

14 While that may not be the same requirement for  
15 pipeline injection because there is a fraction, I believe,  
16 with the regulated pipeline specifications as those  
17 components that can be passed on, that's not the case in  
18 liquid natural gas. You basically have to get all of the  
19 water and CO2 out, down to very, very low levels.

20 Landfills are unique in that they produce all  
21 sorts of surprises in terms of contaminants that are hard to  
22 plan for and can vary widely in short periods of time just  
23 because by their nature they're degrading trash that comes  
24 from various sources. So that creates a hurdle that we've  
25 been able to overcome, but it is a day-to-day struggle in



1 terms of cleaning that out. So when you look at pipeline  
2 injection, I'm not definitely an expert on this, but there  
3 clearly are different components that -- that we can handle  
4 better or manage better when we're keeping it local on this  
5 site. And if we have a -- basically a bad load of LNG  
6 that's produced that is easy to deal with, whereas if it's  
7 put into a pipeline, I'm not quite sure what the remedy is  
8 for it at that point.

9 MR. OLSON: And we're aware that there are legal  
10 restrictions on landfill gas going into pipeline. So that  
11 would be of interest to us to find out more about that.  
12 Plus your assessment of what the real potential -- total  
13 potential is in terms of displacing natural gas.

14 MR. MONTAGUE: Yeah, there are a handful of really  
15 key landfills here in California that are great candidates  
16 for a project like this. What -- when we started this  
17 business, Dr. Barclay, who's not here, dreamt of a liquefier  
18 in everybody's garage. And we started very small scale,  
19 which what we've learned is that's probably as small as  
20 we'll want to go in the future. In the next few months, I  
21 believe you'll see another one of these facilities come on  
22 out of [inaudible] landfill in Central or Northern  
23 California that is about double, maybe even a little bit  
24 larger scale than our facility. And that's probably more of  
25 the sweet spot long term to attract private investment and

1 get the right return on investment because you have to  
2 have a fairly sizable landfill with a good, steady gas flow.  
3 That's -- California has a -- a lot of candidate landfills  
4 out there for that, more than most other places in the U.S.

5 MR. OLSON: Okay. Thanks a lot.

6 MS. BAROODY: Thanks, Eric. Appreciate it.

7 Okay. Mike Eaves, would you like to come back and  
8 present Clean Energy.

9 MR. EAVES: Thank you. I'll try to faster this  
10 time and try to pick up some time.

11 I was asked to talk about biomethane. Clean  
12 Energy has a natural gas cleanup system in McCommas Bluff,  
13 in Dallas, Texas, a landfill that we've purchased the gas  
14 rights to a year ago. There's an awful lot of public policy  
15 that -- that really enhances the value of biomethane, and  
16 Clean Energy really is in the market to offer low carbon  
17 fuels. We're delighted that natural gas, CNG, and LNG are  
18 low carbon fuels under the low carbon fuel standard, but  
19 we're also looking at the 2050 guidelines, and landfill gas  
20 and renewable natural gas has a way to get there.

21 If you look at the sources of biomethane, you've  
22 got landfills, you've got wastewater treatment plants,  
23 digesters, either manure or ag waste, and you've got forest  
24 waste. The reason, obviously, that we're looking at it is  
25 you can see CNG and LNG if you would make that at a

1 landfill. Those are -- I think -- I think the 11.4 is  
2 CARB's number. The 16.7 is my number using their formulas.

3 But there's 254 million tons of waste generated in  
4 the U.S. every year, 137,000 -- or 137 million tons of that,  
5 54 percent, go to landfills. McCommas landfill has -- when  
6 we acquired it had a little over 30 million tons in place  
7 and about 2.2 million tons a year. We're currently  
8 producing 4.5 million cubic feet a day into the Atlas  
9 pipeline in Dallas. That's equivalent to about 35,000  
10 gallons a day. It's sufficient to power about 30 megawatts  
11 of combined cycle power. In fact, we are selling that gas  
12 to Sacramento Municipal Utility District to get the low  
13 carbon renewable portfolio standard credit for them.

14 Cost effective gas cleaning technology. We really  
15 need gas flowing of somewhere above 1000 standard cubic feet  
16 a minute. That's a pretty hefty flow rate. Lower flow  
17 rates, the capital costs are kind of marginal on the  
18 economics.

19 The reason we like landfills, there are a  
20 significant amount of contracts and infrastructure in place.  
21 They already have contracts for waste collection in urban  
22 areas. They transport to landfills. The landfills are  
23 already permitted. You've got tipping fees that are being  
24 collected. You've got landfill environmental quality air  
25 permits already. You've got a gas collection system you

1 have to do for regulatory control under EPA. You've got  
2 wastewater treatment systems, and you leave the waste from  
3 the plant directly in place.

4           So what you have to have is a cost effective gas  
5 cleanup technology, and you have to come up with either a  
6 pipeline connection to deliver it to the market or you've  
7 got to -- as Eric was saying -- you've got to liquefy it  
8 and -- and haul it off site.

9           Pipeline access. The reason we like that is you  
10 can nominate that gas anywhere you want in the system. If  
11 you want to pay the -- right now you have to pay your  
12 transportation rates to get it to California, but Clean  
13 Energy could take that gas and nominate it to our fuel  
14 stations. We could nominate to our LNG plant in Boron and  
15 have low carbon LNG [inaudible] from it.

16           There are a lot of different gas processing  
17 technologies, some newer and more catchy than some of the  
18 older that are tried and proved and around the world for  
19 years and years and years. We use pressure swing absorption  
20 at McCommas. Pressure swing absorption does combine some  
21 other type of processes in it.

22           We've got membrane technology. That's the newest  
23 one on the block, and we have solvent systems, a number of  
24 these using refinery operations for years and years. We  
25 have sulfur removal systems, either batch or continuous

1 systems. Sulfur is a problem. We have about 300 or 400  
2 part per million sulfur in our gas coming into our plant,  
3 and it costs us about a million to \$2 million a year to get  
4 rid of it. And you can come up with cleanup systems that  
5 can involve any number of combinations of any of the above  
6 technologies.

7           On the economics, biomethane as a transportation  
8 fuel should command a premium carbon credit trading under  
9 the low carbon fuel standard. But that's not going to be in  
10 place until 2011. That's why we're selling the gas to the  
11 power generation market right now. And it commands a  
12 premium price on the power generation market because it  
13 turns out to meet the renewable portfolio standard and it's  
14 getting more difficult and more difficult to -- CPUC's  
15 already placed a value on that carbon for renewable.

16           So the industry -- the renewable industry is  
17 lobbying the Energy Commission and CARB and EPA to -- to  
18 consider swaps where we don't have to pay. Right now we pay  
19 94 cents a million BTUs to transport gas to California. And  
20 that's a paper transaction, and all that does is increase  
21 the price on the other end. You can do swaps for  
22 electricity. You can do swaps for gas. We think you could  
23 do -- should be able to use swaps for renewable gas.

24           You've got 578 landfills under the EPA's landfill  
25 methane outreach program -- and these are landfills. There

1 are more projects than that, but these are the big  
2 landfills. 422 of those projects are producing electricity,  
3 19 are producing gas -- high-BTU gas. And nobody's doing  
4 high-BTU gas in California because of the restrictions.

5 This is taking a look at those 578 landfills and  
6 looking at how many tons in place, and you can see there's  
7 an awful lot of -- an awful lot of landfills that have less  
8 than 10 million tons of waste in place. And that means if  
9 you're going to -- to look at fostering biomethane from  
10 landfills, that you're going to be looking at smaller  
11 landfills, smaller gas flows, smaller gas treatment plants,  
12 and late models don't exist.

13 I want to put this in. This came out of the CEC  
14 roadmap, and it kind of puts biomethane in there as a source  
15 from landfills and wastewater treatment plants. But the one  
16 thing I want to point out is that electricity band and the  
17 combined heat and power, a lot of that comes out of  
18 landfills too. And in the future, if you can't -- there's  
19 an awful lot of issues right now regarding permits for power  
20 generation at landfills, and you're better off to burn  
21 larger facilities and generate lower emissions. So those  
22 two bands, they're electricity and combined heat and power,  
23 those are biomethane potential sources that will compete for  
24 economics in the market.

25 Also, there's an awful lot of biofuels. The --

1 you had the workshop over Monday and Tuesday talking about  
2 the various biofuels, looking at ag waste products. There  
3 are -- there are some very significant and emerging chemical  
4 and thermal treatment of -- of those waste streams and  
5 everything that could generate pipeline quality natural gas  
6 versus biofuels. So we've got some intense competition  
7 going to take place in the next several years for those  
8 resources.

9           And this just shows that -- it shows you what --  
10 that the biomethane from landfills and wastewater treatment  
11 could be a lot larger and you could -- you could -- you  
12 could essentially have 300 to 400 billion cubic feet of --  
13 of biomethane if -- if those other markets and everything  
14 can't compete with -- with high-BTU gas.

15           So biomethane's going to play a role in the NGV  
16 market. And that's our strategy is to go out and develop  
17 low carbon fuels that we can use in our stations. I think  
18 that you'll find out when you start looking at some of the  
19 conversion technologies to biofuels that you're going to see  
20 that -- that converting to high-BTU gas is more efficient  
21 than -- and economic than some of the other alternatives.  
22 And therefore, we are probably going to be competing for  
23 some of those resources.

24           The real key right now is achieving good economies  
25 of scale, good economics at small production resources, and

1 obviously clean up sufficiently to access pipelines.

2 I think these are some things that the Energy  
3 Commission can -- should consider. Sponsoring gas sampling  
4 and testing programs around the U.S. of these high-BTU  
5 plants that are putting gas into pipelines. I think that  
6 probably some gas sampling needs to be done on pipeline gas  
7 to make sure that we don't create an unfair standard for  
8 biomethane to meet, make sure that we've got an equal  
9 playing field.

10 And then on the small scale gas cleanup, I think  
11 that's a role for the Energy Commission because the -- the  
12 plants like we have, we have -- we're treating 9 million  
13 cubic feet a day of gas in McCommas, and the scale of  
14 equipment is really suited to do that. But if you start  
15 getting the smaller landfills and smaller digesters, some of  
16 the economics don't pencil out, and there's really a need  
17 to -- it's not really R&D need, but it's really a need to  
18 engineer smaller scale systems to address some of these  
19 smaller resource sources for natural gas.

20 That's it.

21 MS. BARODY: Thanks, Mike.

22 MR. OLSON: Mike, I have a question. Do you have  
23 any information on the capital cost of these kinds of  
24 projects, even if it's a ballpark estimate?

25 MR. EAVES: The capital cost, I had a slide on



1 that, but I took that out. Costs 2, 2 to 2 and a half  
2 dollars capital per -- per -- per cubic foot, so our 9 --  
3 our 9 million -- well, our 4.5 million -- 4.5 million cubic  
4 feet a day plant will run somewhere between \$9- and  
5 \$11 million if you were to build out today.

6           You know, operating costs, you know, it's under --  
7 it's all under, say, \$6.00. Some of that is our -- in  
8 McCommas we manage the rail fuel operations and that costs  
9 us about \$1.00 -- \$1.00 a million to -- for labor and  
10 everything to -- to keep air infiltration out of the  
11 collection system. And so we need a target price of  
12 somewhere in the area of \$6.00 a million BTU. The  
13 marketplace now of \$3.00, that certainly isn't going to cut  
14 it. But there's very large premiums in the -- in the power  
15 generation market, so we're -- we're making money.

16           MR. OLSON: And one of the things I think worth  
17 looking at is -- I think you're right on the cap and trade.  
18 However the AB 32 cap and trade, that system, evolves, the  
19 greenhouse gas emission reduction value credits, whatever  
20 you want to call it, can be significant.

21           I worked on three different projects, facilitated  
22 work down there, and offshore. These are Thailand,  
23 Malaysia, Philippines. Two -- two projects were the first  
24 development mechanism projects going through the [inaudible]  
25 process. In essence, the Dutch government invested money

1 and got part of the credits for building these, and these  
2 were -- one of them was a pig manure, one was a casaba melon  
3 plant, lots  
4 of -- lots of methane. And the value of those CEM credits,  
5 minimum 50 percent of the capital costs, 58 percent on the  
6 biggest one. That market is not available to us here.

7 MR. EAVES: That's not available, but we just  
8 had -- we just had carbon exchange people out trying to --  
9 this week -- at McCommas -- evaluating were we compliant and  
10 how much we can generate in carbon credits there, so yeah.  
11 It's a whole different ballgame here than -- than in Europe.  
12 And in Europe, they have a lot of small scale digesters and  
13 small scale cleanups. But they have totally different gas  
14 pricing there so --

15 MR. OLSON: Uh-huh.

16 MR. EAVES: -- that skews the economics.

17 MR. OLSON: Okay. Thanks a lot.

18 MS. BAROODY: Thank you, Mike.

19 Okay. Well, we have two more speakers today.

20 Next is Ken Brennan with PG&E.

21 MR. WARD: I'd just like to say, Ken, I'm going to  
22 go easier on you today than I did the other day, and what we  
23 talked about the other day is on the record already so --

24 MR. BRENNAN: I appreciate that. You asked some  
25 good questions the other day. Whole new game.

1           We have talked all week about a lot of different  
2 feedstocks, potential feedstocks, 100 different issues. So  
3 what I'd like to do is very quickly formalize everything  
4 that I had. I've got a brief presentation that's going to  
5 formalize some of the things I said Tuesday, and hopefully I  
6 can add on some stuff and answer some questions that you --  
7 you may have based on the time since then.

8           In a nutshell, PG&E is very interested in bringing  
9 whatever renewable gas we can onto our system for whatever  
10 purpose. These projects are good for California, good for  
11 the environment, and help advance the State's goals. Peter,  
12 as you mentioned before, we do have our RPS goals. That is  
13 on a different side of the business I'm in. So I like these  
14 projects. This is what I do for a living. So I'd like to  
15 stress that before I get started.

16           So there are certain barriers to getting  
17 biomethane into our pipelines. And they're -- one of those  
18 is permitting, which we spoke about on Tuesday. A big one  
19 we spoke about on Tuesday was gas quality. So I can  
20 formalize what I said there.

21           There are a lot of good uses for biomethane that a  
22 lot of folks can talk about. Flaring's not the best option  
23 in the world. There's on-site generation. Delivering gas  
24 to the pipeline is what I do for a living. But AB 118 is  
25 about vehicle fuel, so we can discuss what to do with that.

1           An end-use assessment -- I'm going to skip a lot  
2 of this because we're here to talk about vehicle fuel. But  
3 at the end of the day, every one of these uses of renewable  
4 biomethane has pros and has cons. But as far as getting gas  
5 into the pipeline is concerned, the biggest things we have  
6 to talk about are permitting, the economics of the project,  
7 gas quality, and, of course, proximity to pipelines.

8           PG&E's role in these projects is simply to accept  
9 this gas. That's all any gas utility's going to do is  
10 accept this -- the gas into the pipeline, taking ownership  
11 most probably at the meter. The project developer is going  
12 to start from the feedstock, through processing, down to the  
13 compressor. Utility ownership is going to take place at the  
14 meter and, through the interconnection, tap into the  
15 pipeline.

16           PG&E does not operate these projects, but what we  
17 will do is we will help with the planning and facilitation  
18 of these projects. That includes project siting, which I  
19 believe Kay mentioned on Tuesday. I forget Kay's last name.  
20 But so we can -- we can be a big help at siting these  
21 projects. We know where a lot of these biomass sources are.  
22 We obviously know where our pipelines are. So one quick  
23 phone call, we can at least do initial -- an initial  
24 assessment of what a good project location would be.

25           Also, just because you're near a pipeline does not

1 mean that pipeline can accept the gas you're trying to  
2 inject. If you're near a transmission pipeline that  
3 dead-ends into a distribution system out in the Valley where  
4 it's 110 degrees during the summer, there's no gas flow in  
5 those pipelines.

6 Tim and I were sweating to the oldies down at  
7 Vintage Dairy near Fresno. It was like 105 that day or  
8 something. It was crazy. I'm Irish-German. I didn't bring  
9 a hat. It was not good.

10 MR. OLSON: And you have to -- you have to really  
11 experience that in a dairy farm at 105 degrees.

12 MR. BRENNAN: And don't forget the flies. That  
13 was wonderful.

14 So at the end of the day, what I'm saying is  
15 there's no gas moving in those transmission pipes -- I'm  
16 sorry, distribution pipes heading out to individual small  
17 communities or -- or individual customer sites. The big  
18 transmission pipes, in Vintage Dairy's case, which feeds  
19 Fresno, obviously there's gas moving on that pipeline.  
20 That's a great project to -- to inject into -- a great  
21 pipeline to inject into.

22 But there are many pipelines in, like, the  
23 Firebaugh area, Mendota area, that feed communities on a  
24 distribution system. That's an example of a pipeline that's  
25 not good to inject into.

1           At the end of the day, the utilities can help  
2           with  
3   all that. We will test the gas quality of any  
4   non-traditional organic feedstock that we get. That's one  
5   of the biggest items that I'm here to talk about. And we'll  
6   in turn, of course, transport the biomethane at the least  
7   cost tariff that we can get it under. And currently that's  
8   California production tariff.

9           Okay. Taking these challenges apart one by one,  
10   as I mentioned the other day, incentives are definitely  
11   needed. A production tax credit would be great. We're  
12   trying to get that through Washington, D.C., right now.  
13   There's a coalition that's working on that. That would be a  
14   production tax credit of \$4.27 per MMBtu of gas. And I  
15   haven't heard the current status since Tuesday, but it  
16   definitely reached the subcommittee of the House.

17           Permitting. Co-digestion is a great way to  
18   enhance the gas production at these facilities, the  
19   production facilities. Manure-only projects only create a  
20   certain amount of gas. But if you were to take another  
21   feedstock like fats, oils, and grease, for example, or sugar  
22   beets -- I don't know anything about sorghum, but I heard it  
23   the other day. It looks like a pretty good feedstock. If  
24   you were to mix that in some way and a slurry into it into a  
25   digester, that's going to elevate the production. Right now

1 facilities get classified as a landfill if you import a --  
2 a waste across the property line. My argument is the waste  
3 definition is no longer valid. That should be classified as  
4 an asset or a feedstock for another purpose. So that's  
5 probably a decade-old definition that we need to change at  
6 the Waste Board.

7 I do understand the groundwater impacts that the  
8 Water Board's concerned with, so we have to proceed  
9 carefully with co-digestion. But at least the permitting  
10 can be made a little bit easier there.

11 Permitting is very time consuming. [Inaudible]  
12 spent over two years trying to get its permits for its first  
13 dairy project. That's just one example. Bioenergy  
14 Solutions had a lot less time requirement because they had  
15 different technology, et cetera, but there is an effort in  
16 Sacramento, as I mentioned on Tuesday, to shorten that time  
17 frame.

18 Gas quality. I'm going to quickly get onto that  
19 because it's a big topic of conversation. Currently, PG&E  
20 and at this point SoCal Gas has approved for agricultural  
21 animal waste [inaudible] digestion. The acceptance of any  
22 kind of new feedstock is going to require a tariff change,  
23 and we are going to have to do a great -- a lot of study and  
24 a lot of testing in order to accept this gas.

25 Every feedstock that's out there can have

1 different impacts on the -- on the gas quality. There  
2 could be different microbes, different impacts on the -- on  
3 the finished product of the gas. There's everything under  
4 the sun out there. The more complicated the feedstock, the  
5 more complicated the testing has to be. Dairy manure is  
6 simple. Agricultural waste is probably okay, but we need to  
7 test it because we have no experience with it. When you get  
8 into more complex feedstocks like food waste, wastewater, or  
9 landfill gas, the testing is very, very expensive.

10 As I mentioned, we have to test every one of these  
11 feedstocks. We don't have any experience. It's a  
12 non-traditional source of gas. There are different -- lots  
13 of research we have to do. Some of this work might already  
14 have been done in the industry, at least on the initial --  
15 well, biogas I'll call it. We have to test the project  
16 startup, see what's in the finished product gas, and have to  
17 do ongoing testing.

18 The biggest question out there is who can pay for  
19 this testing. Before we can even look at accepting any one  
20 of these new feedstocks source gases, we've got to make sure  
21 it's okay. That requires money to test. To be quite frank,  
22 PG&E is not in a position to pay for that testing. We have  
23 a rate case that happens every so often, so blocks of money  
24 are approved. All the money that we had for gas quality  
25 testing is allocated. New feedstocks are incremental to



1 that. So project developer has to pay or somehow this  
2 research and testing needs to be rate based.

3 All that being said very quickly, it leads to a  
4 lot of things. I think I was talking for about 40 minutes  
5 last time on Tuesday. Tim, you were lucky enough to miss  
6 that, I think. I think you left a little bit early that  
7 day. What can AB 118 do to facilitate getting gas into the  
8 pipeline and how can it benefit vehicle fuel?

9 In a nutshell, in order for biomethane to be  
10 produced at a location that is distant from its distribution  
11 point for a vehicle fuel, more than likely -- well, there's  
12 only two ways you can get from a source of production over  
13 to the rack, and that is going to be either by trucking it,  
14 which hopefully you're using clean fuel trucks, but other  
15 than that you've got Nox issues in the Valley, or you can  
16 put that source gas into a pipeline at quality, and we're  
17 going to ship it right to the rack. And that is a contract  
18 between whoever's producing the gas and the end user of the  
19 gas.

20 We can use funding just to kick start the testing  
21 on whatever feedstock looks most promising out there, what  
22 projects look like they're immediately pending that we can  
23 get some traction on right away. We can use testing to just  
24 get started on that research that we need to do. It's  
25 pretty important that we look at the most impending

1 feedstocks first obviously. These things take a long  
2 time. Testing for manure took like six or eight months to  
3 do. But I'd like to hurry that up. I don't want to wait  
4 that long for more testing. So funding can -- can speed  
5 that along.

6           If we can get AB 118 money for testing gas to be  
7 used for vehicle fuel, what that is essentially going to do  
8 is advance the gas quality testing among the utilities by a  
9 magnitude of years, to be honest with you. Plodding along  
10 at the pace we're going right now, there's very little  
11 testing being done because none of us are going to dedicate  
12 money we don't have to do the testing. So the project  
13 developer is going to pay the freight or it's really not  
14 going to happen.

15           Money that comes out of the State is going to be  
16 public money. That means public data, which is something we  
17 just don't have right now in the dairy industry. All the  
18 data that we have on dairy manure gas is considered private  
19 by contract between the developer and utility, at least on  
20 the PG&E side.

21           And as I mentioned, we can -- Peter had a concern  
22 on Tuesday about how we can say, okay, the State's giving us  
23 money for gas quality testing, how do we know the utilities  
24 aren't just going to jump in and bid all this away, and none  
25 of the money is going to benefit vehicle fuels? It's a

1 great question. The answer is very simple, and I'll say  
2 it again, contracting. Whoever's producing the gas can  
3 contract with whoever's distributing the gas. That's the  
4 end of story.

5 And the last thing I want to talk to you about is  
6 on the permitting side. There is a process going on right  
7 now that is only at this point in time for dairy projects,  
8 and it's happening out of the governor's office. Dan  
9 Pelletier, who used to be with Cal EPA, is now working for  
10 the governor's office, is working on a guidance document, if  
11 you will, that will streamline permitting down to about 20  
12 percent of what it currently is on dairy projects.

13 Vehicle fuel projects are happening at dairies  
14 already in the Valley, so the more of these projects that we  
15 get to happen through a permitting checklist or streamlined  
16 permitting process among the agencies, Air, Water, Waste, et  
17 cetera, this industry wins. So I would encourage you to  
18 look at an RD&D expenditure that could be used for  
19 streamlining the permitting process. And that isn't  
20 mentioned here in the Power -- in the slides. It's about  
21 \$750,000.

22 Contact. My contact information is included right  
23 there if you have any follow-up questions. Tim, I know you  
24 know where to reach me.

25 MR. OLSON: Thanks, Ken. Very valuable to get

1 your insights, and biomethane discussion is going to occur  
2 in another workshop too, our hydrogen workshop on  
3 September 29th in Sacramento. It's a -- it's a fuel  
4 feedstock that generally crosses more than one -- one fuel  
5 area as a potential significant greenhouse gas emission  
6 reduction option.

7 I wanted to ask you a couple of questions about  
8 the -- well, I guess one question on the -- the testing.  
9 One of the things we've been discussing -- well, one of the  
10 things we proposed was a feasibility fund to look at these  
11 types of things. It could cover lots -- and the feasibility  
12 fund is really earmarked for biofuel in the broad definition  
13 of that. So we're getting ideas like does it make sense on  
14 purpose-grown crops to -- we want to know what's the water  
15 impact, and not all just technical economical -- technical  
16 and economic potential, but what's the environmental  
17 footprint, what's the water use, and can you do things like  
18 grow sorghum on -- on land that is marginal, doesn't have a  
19 big water use? And it kind of depends on the location in  
20 the state.

21 Same kind of question on -- on these biogas. In  
22 the testing for -- for quality, pipeline quality. In  
23 essence, we were thinking of having an independent body do  
24 basically analysis for us of all kinds of different  
25 feedstocks and different kinds of things. And does it

1     require a feasibility of each individual site or can -- is  
2     there some margin error for doing this?

3                 MR. BRENNAN:   There -- okay, there's the initial  
4     body of research that has to be done on the feedstocks.   So  
5     I assume that can be -- that can be done anywhere.

6                 MR. OLSON:    Uh-huh.

7                 MS. BAROODY:   Each set of project site can have  
8     different factors involved in the production process.   If we  
9     can assume a standardization and validate that  
10    standardization, then the results of the testing would  
11    probably be applicable to that.   We still have to look at  
12    every site and make sure that there's nothing being added  
13    into the feedstock that we don't know about.   We have to  
14    just go ahead and assess every single project.   And if, over  
15    time, everything is the same as it always has been, then  
16    there's no more stringent testing requirement like that.

17                But in a nutshell, every project out there is  
18    going to be different.   You've got different owners and  
19    operators.   You've got different feedstocks.   You've got  
20    different equipment.   Cleanup equipment, whatever have you.  
21    So until we gain experience with all this stuff, we have to  
22    make sure.   So we have to test each and every site.

23                MR. OLSON:    Okay.   Thanks a lot.

24                MS. BAROODY:   Thanks a lot, Ken, for coming out  
25    again.

1 MR. BRENNAN: Thank you.

2 MS. BAROODY: All right. Next up SoCal Gas. We  
3 have Ron Goodman.

4 MR. GOODMAN: I'm going to have to talk to Ken  
5 after the meeting a little about biofuels.

6 Thank you for inviting me. I don't want to keep  
7 anybody too late here. I'm going to start by saying I've  
8 been in biofuels for two weeks, so -- this is a true  
9 statement. I'm going to corner Ken and get his phone  
10 number.

11 I've been with the Gas Company for 20 years in  
12 engineering operations. I've got a fairly good  
13 understanding of how it works. But I want to thank you for  
14 the opportunity. I'm an emerging markets manager, focusing  
15 on different technologies, one of which is biofuel. So much  
16 of my presentation is a repeat performance from Mike and  
17 Ken, so I'm going to skip over some of the slides that are  
18 redundant. But there are a couple that I think address  
19 Tim's question about how much of the gas coming into  
20 California can be displaced by biomethane. So I'll  
21 [inaudible] on that specifically.

22 I'm just going to skip around. The greenhouse gas  
23 emissions comparison. So when looking at gas and diesel,  
24 the emissions going into the atmosphere versus landfill  
25 capture. So today we talked about capturing methane from a

1 landfill. You can flare it. You can vent it to the  
2 atmosphere. If you capture it, you get a pretty serious  
3 credit for it. And if you look at the comparison to gas and  
4 diesel versus the credit that comes back from landfill gas,  
5 it's significant. What I think Ken mentioned was you have  
6 very stringent pipeline gas quality specification. And  
7 today, even with 30, which is our pipeline spec, doesn't  
8 allow for gas to come back into the pipeline from landfills.  
9 So back to permitting. That's something we'd have to  
10 overcome and that's -- that's one of our biggest challenges.

11 Methane is 21 times more potent greenhouse gas  
12 than carbon dioxide. So if you look at the emissions pie,  
13 this shows the piece of the pie that makes up methane and  
14 how much of that is landfill and livestock. I thought it  
15 was a pretty good graphic in terms of scale.

16 Just education. This was actually a great  
17 education for me the last week. Where does biomethane come  
18 from? So these are the feedstocks. Those of you that have  
19 not done this before, you know, where does this stuff come  
20 from? How do they break it down? Well, there's a lot of  
21 companies that manufacture equipment that breaks down the  
22 various feedstock compositions.

23 Another thing that Ken -- where are you, Ken?  
24 Ken, that was a great talk, by the way. Another thing that  
25 Ken said is controlling the feedstock is critical. If you

1 don't know what's coming in, you don't know what type of  
2 equipment to specify, and you don't know what's coming in on  
3 the back end. So when it comes to pipeline grid gas, we  
4 need to know what's going into that pipe at a very detailed,  
5 miniscule level. And today we believe there's technologies  
6 available that if the feedstock is controlled to a specific  
7 range, the equipment that Mike spoke of, the membrane  
8 conditioning equipment, the positive swing absorption  
9 system, those vendors feel that they can clean it to meet  
10 our 30 spec. But without significant testing to verify that  
11 that actually can happen, we're not so apt to -- to take the  
12 output of a conditioning system, compress it, and stick it  
13 into a pipeline.

14           So back to another thing that Ken said, we are  
15 interested in running some pilots. How are those pilots  
16 going to be funded? You could help us in providing some of  
17 that funding so that we could do adequate testing so that  
18 we've got a confidence level that this process, end to end,  
19 works.

20           Another question, Tim, I think you -- you brought  
21 up was the displacement. So biomethane, through its many  
22 sources, landfills, dairies, wastewater treatment, when  
23 compared to the amount of gas that's coming into our system  
24 from out of state, this shows how much of that could be  
25 displaced through biomethane. And, of course, there's a ton



1 of variables in that 16 percent, one of which is the  
2 landfill, being able to accept the gas in the pipeline, and  
3 today we can't.

4           This just gives a -- I think an overview of the  
5 loop system for energy crops. We've been talking about  
6 equipment. On the top left, this is digestion equipment for  
7 wastewater. Biomethane's produced. It feeds power  
8 generation block. CO2 comes out the stack, and it feeds an  
9 algae pull. And the algae's pulled off and fed into the  
10 digester. So this is almost a continuous loop process.

11           One thing that I don't think we spoke of is we  
12 want to be able to leverage existing infrastructure. So  
13 when we have new technologies, like we're talking about  
14 building infrastructure for CNG vehicles, that doesn't  
15 exist, where do you put it, how much does it cost? I like  
16 the comment -- I think it was the comment that was made  
17 about let's put a CNG station right next to gas and diesel  
18 so it makes it easy for the customer. Well, if we can  
19 utilize existing pipelines and storage fields, the power  
20 plants, we don't have to build new things to accept the gas,  
21 and that manages our capital costs.

22           Digestion equipment is already in place at  
23 wastewater treatment plants, but what we found is it takes a  
24 pretty good sized plant for the economics to pencil. I  
25 think the question was asked, you know, what -- how much --

1 how much do these pieces of equipment cost? It's millions  
2 of dollars. And if it's a [inaudible], the amount of  
3 investment is very difficult to overcome from the beginning.  
4 If you already have that equipment, you have 100,000 gallon  
5 digester, you also need about \$30 million worth -- \$30- or  
6 \$40 million worth of capital. So if all you need to do is  
7 add a conditioner, compress it, and then feed it into the  
8 pipeline, you'd save a ton of money. And I think the number  
9 was quoted about \$10 million, which is what we found as  
10 well.

11 We've done quite a bit of feasibility study over  
12 the last couple years. We talked about the Rule 30  
13 guideline. So we do accept biomethane into our pipelines,  
14 other than landfill, but the stringency of the specification  
15 is difficult for a lot of producers to overcome. So in some  
16 of the pilots that we're considering, talking to the  
17 conditioning vendors, they're saying, you know, this is just  
18 too tough. We don't know if we're going to be able to meet  
19 that spec. But we're concerned about the end user. We're  
20 concerned about, you know, having something that we can  
21 control, that's reproducible, that's consistent, where we  
22 don't have to worry about what -- what comes in.

23 There's technologies available. We do not have  
24 enough data. We haven't been in the game long enough to  
25 recommend specific vendors or specific technologies. We

1 know that the membrane and the PSA, the [inaudible],  
2 cryogenics, they're all available, they all are capable of  
3 removing trace constituents, but again, our confidence level  
4 isn't significant enough to say that they all do the job at  
5 a level we're comfortable with. So funding to support more  
6 testing and more studies. We're happy to be the guinea pig  
7 and line up the customers and set up test sites, but it  
8 takes quite a bit of funding to make that happen.

9           We do have a demo in progress currently with  
10 Escondido Wastewater Treatment down in San Diego. So we're  
11 going to be testing out the positive screen absorption  
12 system and flaring the gas. So what we'll be doing is  
13 testing it, making sure that it meets our quality spec, and  
14 then it will be flared. And then we'll use that to gather  
15 additional data.

16           On the anaerobic digestion, most digesters are a  
17 challenge without a tipping fee. The tipping fee is just  
18 the diversion credit you get from dumping it into the  
19 landfill, so that's money coming back in your economic  
20 model. And we talked about dairies. We found that unless  
21 you cluster the dairies -- so you have several dairies out  
22 in the Central Valley, you have dairies with 2000 cows, 1000  
23 cows, 3000 cows -- unless you consolidate all those cows  
24 through a gathering system and run it through a central  
25 conditioner, the economics just don't pencil.

1           So now you get into the permitting situation  
2 where I need to get from my property to your property, but  
3 there's three properties in between that are really small  
4 dairies. So it requires easements, permitting, it takes  
5 time. There's potential environmental impact reports. So  
6 these are all the challenges that we would need to overcome  
7 in order to make this viable.

8           These are some of the trace constituents that have  
9 been found. And again, the conditioning vendors feel that  
10 they can meet the mark and meet our standard. These are  
11 some of the technologies that I spoke of and Mike was  
12 talking about that are available. Unless we have additional  
13 demonstration projects so that we could validate the  
14 protocols and have some level of consistency in the  
15 feedstock output, we just don't have a lot of experience.

16           This is the cost curve. It comes down to a very  
17 large water treatment facility or a 10,000-cow dairy where  
18 the cost curve tends to line up with \$6.00 to \$9.00 per  
19 MMBtu cost. So if -- if a developer makes the investment  
20 and he can produce it for \$6.00 and he can sell it for  
21 \$10.00, they're pretty happy. Plus, if they get the RPS on  
22 the back end for pipeline injection, that's -- that's a very  
23 nice benefit.

24           In case you wanted to see what a PSA system looks  
25 like, this is the vessel equipment. [Inaudible] stream,

1    which isn't shown, is the feedstock vessel or the digester  
2    that feeds this compression unit, which feeds into the  
3    conditioning system. And the output could be pipeline  
4    injected generation or even liquefied and carted off.

5               This is an aerial of a digester farm in Germany  
6    similar to the process that I showed.

7               This is called gasification. It's basically  
8    putting feedstock into an oven, baking it, and pulling gas  
9    out the top. It's a little bit more complicated than that,  
10   but it's another technology that we're looking into. And  
11   again, it's based on consistent feedstock composition.

12              So utilities can play a role in the market  
13   development for renewable gas. We want to help establish  
14   core requirements for the processes and interconnection.  
15   We're developing these as we speak. We're trying to  
16   understand the best model for taking the feedstock through  
17   the conditioner, through the compressor, and back into our  
18   pipeline through an interconnect. We want to make sure that  
19   we've got adequate infrastructure to accept the biomethane.  
20   And we want to have processes put in place for contracting  
21   for gas and power sales. We want to keep it -- well, I'm  
22   just going to skip it in the interest in time.

23              What's needed now? We talked about commercial  
24   pilots, evaluating the economics, making sure the  
25   operational data lines up. We'd like to be able to

1 reference projects for future financing support. And back  
2 to where you could help the utilities. Permitting and EIRs.  
3 They take a lot of time. They can be costly. They could  
4 pretty much stop a project from moving forward. There's  
5 also credit and technology risks that are apparent. Some of  
6 the industries that we're looking at, there's credit risks  
7 out there because their -- their market is not that strong.  
8 So they might go under after we put the infrastructure in  
9 place, so we've got to look at that. Also, the  
10 technologies, we want to make sure that we manage the -- the  
11 risk associated with struggling the gas to meet the quality  
12 levels that we demand. And then there's the program  
13 qualifiers, incentives, RPS's, SGRP's, things like that. So  
14 that's -- I think that's my last slide.

15           So in summary, I'm kind of echoing all the  
16 presentations that were made before me. We don't have a lot  
17 of experience in this area, but we're willing to put our toe  
18 in the water, and we've got a lot of customers that are  
19 interested in this, especially the large-scale wastewater  
20 treatment plants that have on-site generation that's not  
21 working because the [inaudible] that come out of their  
22 digester tends to gum up their compressor, so they're  
23 looking at alternatives. But it's very costly to put in  
24 equipment, and we want to help potentially by owning our  
25 equipment and leasing it back. We're looking at different

1 types of models. But this isn't our core business, so we  
2 need some help to manage our risks. And that's about it.  
3 So any questions?

4 MR. OLSON: Yeah. Thanks for good comments on  
5 your project for being in business two weeks.

6 MR. WARD: Pretty good job for two weeks.

7 MR. OLSON: Can you clarify -- Rule 30 is specific  
8 to the Sempra, PG&E, SoCal Gas? Is that a -- or is it a --

9 MR. GOODMAN: Sir, my understanding is it's our  
10 pipeline specification. I'm not certain that PG&E is held  
11 or holds to the same specification.

12 MR. BENNETT: [Inaudible.]

13 MR. GOODMAN: Are they consistent?

14 MR. BENNETT: [Inaudible.]

15 MR. GOODMAN: Okay. No. There might be some  
16 elements that are, you know, a little bit off, but that's  
17 our gas specification rule.

18 MR. OLSON: I guess what I would like to know more  
19 about is whether that is driven by -- that rule is driven by  
20 just your requirement to make sure there's a certain  
21 standard you want to meet and to what extent does the Hayden  
22 legislation kind of draw on things like you can't use  
23 landfill gas and power generation, vinyl chlorides, other  
24 issues. I think Ken might have an answer to that too.

25 MR. BENNETT: Two weeks, huh? [Inaudible.]

1 There's a difference in the SoCal Gas, SDG&E, [inaudible]  
2 PG&E. The biggest difference I'm aware of is PG&E requires  
3 a one percent CO2 injection, SoCal Gas and SDG&E can handle  
4 two percent, I believe. It's either two or three.

5 As far as landfill gas is concerned, Hayden's --  
6 call it Hayden's Law, 1986, '87 I believe it was,  
7 specifically focused on vinyl chlorides, something along the  
8 lines of vinyl chlorides can't get to the customer's homes  
9 or to our facilities. [Inaudible.]

10 MR. OLSON: And one other question that we didn't  
11 really cover in any of our discussion today was the -- how  
12 these projects would get financed. In essence, our fund is  
13 a seed fund for the most part, a billion dollars, and we're  
14 going to need \$100 billion of other investment, mostly  
15 private. In my mind, there's some really upsides to this in  
16 terms of what would attract investors beyond just government  
17 utilities making investment in these projects or dairies.  
18 And one of the -- and maybe it's just too premature at this  
19 point to figure that out, that we've got to go through the  
20 kind of proving this and making it known to the investment  
21 community out there that these are good projects.

22 MR. GOODMAN: In my two weeks of knowledge and due  
23 diligence, it seems that as long as the scale of  
24 magnitude -- there's so many variables. Scale of magnitude  
25 needs to be there to offset the capital cost associated with



1    what it takes, dollars per MMBtu, that's, you know, on the  
2    downstream side, to warrant such a thing. Controlling that  
3    feedstock. There's some industries that have feedstock that  
4    could be managed at specific levels. Others, it's all over  
5    the board. So I think, you know, the conditioning  
6    equipment, as long as the feedstock is consistent, they can  
7    meet the mark to meet pretty much any -- any pipeline spec.  
8    But upstream of that, I don't know because I -- my  
9    understanding, there hasn't been enough testing to know how  
10   to control what goes into the digester so that what's coming  
11   out in raw gas, which is about 60 percent methane, has the  
12   constituents that we expect without new things showing up  
13   that we don't expect that a conditioning piece of equipment  
14   can't handle.

15           MR. OLSON: Another thing that I think might be  
16   worth looking at is when we visited the Vintage Dairy  
17   project, that one constituent of that kind of cleanup  
18   process was what to do with the CO<sub>2</sub>. And my understanding  
19   was it just -- it's released in the atmosphere. You still  
20   get a significant, 80, 90 percent, greenhouse gas benefit,  
21   but if there's some way -- is this worth some effort to --  
22   whether it's R&D or whatever -- to figure out how to capture  
23   that or -- you can't burn it. It's an inert gas, so -- but  
24   it's also a contributor to the -- to CO<sub>2</sub>.

25           MR. GOODMAN: We're actually -- we have a demo or

1 an R&D project that generates power with CO2 input. It's  
2 happening in Bakersfield. I don't know a lot about it, but  
3 I -- a guy just happened to tell me about it a couple days  
4 ago, so it's timely. And I could provide that information,  
5 but it's very interesting. It's a brand-new -- newer  
6 technology.

7 MR. OLSON: Very good. Thanks.

8 MR. GOODMAN: Okay.

9 MS. BAROODY: Thank you, Ron.

10 Okay. Well, that concludes our day, although we  
11 do have a quick public comment period. If anybody here in  
12 the audience would like to come to the podium, make a  
13 comment.

14 MR. BRUDERMAN: Madam, this is Dave Bruderman from  
15 Gainesville.

16 MS. BAROODY: I'm just Leslie.

17 MR. BRUDERMAN: I'm sorry. Dave Bruderman.

18 I had come here to learn from California and  
19 translate back to Florida, but interesting things going on  
20 in Florida that the biomethane folks here could benefit  
21 from.

22 We got about \$10 million from the Department of  
23 Energy and the Gas Research Institute. It went to the  
24 University of Florida back in the -- I'm showing my age --  
25 but the late 1970s, 1980s, and we did quite a bit of basic

1 research on the anaerobic digestion of every type of  
2 biomass feedstock you can think of, including algae.  
3 Hyacinth, hydrilla, pine trees, pine needles, poplar, what  
4 they call switch grass or what we in Florida call Napier  
5 grass, energy kind, all that stuff. It's all very  
6 digestible.

7           Dr. Ann Wilkie at the University of Florida is  
8 still very much alive and kicking. She's a very passionate  
9 Irish woman and very, very knowledgeable on -- and can  
10 provide a lot of the types of data that I think you've heard  
11 a request for to obtain. Dr. Wilkie has a whole bunch of  
12 graduate students who are now digesting, for example, food  
13 waste. And some of the things that we've learned -- and  
14 I've been involved with this on and off for the past 25  
15 years myself -- we've learned it again with the biomass.  
16 Unless you have a lot of biomass coming together for other  
17 reasons, such as at a landfill, the transport issues become  
18 very difficult. So smaller is beautiful.

19           So if you're thinking digesting, for example, food  
20 waste, I have a friend, Dr. David O'Keefe, who builds a very  
21 small anaerobic digester that you could put at a shopping  
22 center, and it would replace all those smelly old dumpsters  
23 that sit out behind the restaurants that attract whatever  
24 and could sit right there next to your grease collection,  
25 which you're using for your biodiesel production, and the

1 food waste that is not grease and fats could go into  
2 these -- this small digester and basically would come out as  
3 methane which could be used to heat hot water. Obviously  
4 there's permitting and safety issues with this, and this is  
5 the kind of role where the gas utility could be very helpful  
6 in helping restaurant operators and cafeteria people and  
7 folks like that figure out how do you do this without even  
8 putting it in the pipeline, because when you get in the gas  
9 cleanup or compression at a very, very small scale, the cost  
10 goes through the roof.

11           We're doing a pilot project on this one at the  
12 University of Florida in the cafeterias, the dormitories,  
13 and Dr. Wilkie could provide some -- some of the latest  
14 information on that. But it's a very interesting project,  
15 and it shows that there are solutions to the sustainability,  
16 there's solutions to these bioenergy opportunities that are  
17 not scalable. I mean you have to -- you have to do them  
18 with a small -- small scale. So I just kind of ask you to  
19 maybe think about that or include that in your plan is doing  
20 some small-scale work.

21           On the liquefaction that I heard earlier from the  
22 fellow from Prometheus, Dr. John Barclay and I, about 15  
23 years ago, tried to put a liquefier on an anaerobic digester  
24 in Fort Lauderdale at the North Broward County wastewater  
25 treatment plant. And the reason he had that opportunity at

1 the time was that Florida Power and Light, which now  
2 claims to be the world's largest generator of wind  
3 electricity, would not allow an interconnect into the grid  
4 so that they couldn't use the biogas to make electricity and  
5 they were flaring 2- to 5000 gallons a day equivalent of  
6 methane, not to mention a couple tons of carbon dioxide. So  
7 we put a proposal together to put one of these 5000 gallon a  
8 day liquefiers on that gas stream that was being wasted and  
9 had it all ready to fund and had private sector financing  
10 lined up when an LNG terminal -- import terminal was  
11 proposed, and it knocked the price of methane down to about  
12 25 cents a gallon, and the project financing went away.

13           These projects can be done. I don't think the  
14 technology is rocket science. It's readily available. But  
15 it's really a question of getting the financing and the  
16 incentives lined up with the right kind of policy. And the  
17 point I want to make, the reason I bring this up, is that we  
18 need performance-based criteria for the allocation of  
19 subsidies and incentives. And you guys have done a great  
20 job with your well to wheels fuel lifecycle assessment  
21 modeling that we've modeled, for example. You need to  
22 use -- take these data and put some teeth in them by tying  
23 your funding of subsidies to how much actual carbon  
24 footprint reduction a project or a technology will get. I  
25 can't overemphasize that. I think it's extremely important.

1           MR. WARD: You may be surprised how much we  
2 agree with you.

3           MR. BRUDERMAN: Thank you. And then, once we have  
4 that carbon footprint, if we're talking alternative vehicle  
5 fuel, we own the marquis up there that says whatever it is a  
6 gallon. Right next to it there should be a number that  
7 tells you what the carbon footprint is. You know, in  
8 Homeland Security now, we have orange and green different  
9 security levels. Well, we could put, you know, different  
10 colors or different numbers or something out there just like  
11 we do on a box of cereal so the consumer knows what the  
12 nutrient value is in the food. Well, what's the carbon  
13 footprint value of that motor fuel?

14           And by the way, this gets back to my earlier  
15 comment about multiple fuel capable vehicles, when that same  
16 consumer walks into the showroom floor and he looks at the  
17 sticker on the window of the car, it says we can get "X"  
18 number of miles per gallon in the city and highway. Next to  
19 that it could say, if this vehicle runs on natural gas,  
20 here's the footprint. If it runs on propane, here's the  
21 footprint. If it runs on reformulated gasoline, here's the  
22 footprint. And the consumer knows what he's buying. And  
23 then if he's seeing it every day on the street when he pulls  
24 in to buy fuel, you put one and one together -- and the  
25 average -- you know, 80 percent of us are going to make

1 decisions that make sense for us. But we don't -- if we  
2 don't have the information, we just -- we go blind.

3 MR. WARD: You need to buy your car in California.  
4 I think we have similar things on the stickers right now.

5 MR. BRUDERMAN: We don't have them in Florida.

6 MR. WARD: For air pollution. But that's why you  
7 need to buy your car in California.

8 MR. BRUDERMAN: Thank you. Keep up the good work.

9 MR. WARD: Great. Thanks for your comments.

10 MS. BAROODY: Thanks, Dave.

11 Okay. Pilar, do we have any online comments? Oh.

12 MR. ORR: Ron Orr. And I just want to add on. I  
13 think it was the fellow from Trillium, Bill Zobel, that was  
14 commenting on the lack of a database you can download into  
15 your computer, your car navigation system, with the CNG  
16 stations. He's right. There is no good source of supply  
17 for one of those things on the net. There's a couple of  
18 data -- data silos which were created by the DOE's database  
19 and cngprices.com has a database, but neither one makes it,  
20 you know, can you download.

21 I did write some utilities and created one from  
22 cngprices, which I could send to somebody if they wanted it,  
23 which is good for a Garmin and other GPS's. But I had to  
24 write -- do some screen scraping and write some, you know,  
25 scripts to convert the data. So if anybody's interested, I

1 left my name and e-mail address on the sign-in sheets,  
2 which I presume will be published.

3 MR. WARD: And on that point, I was going to  
4 mention it when Bill was here, it seems to me that Clean  
5 Cities has developed a fuel station atlas.

6 MR. ORR: It's pretty useless.

7 MR. WARD: Oh, you've already seen it?

8 MR. ORR: Huh?

9 MR. WARD: The atlas, not the [inaudible].

10 MR. ORR: No, it's -- again, it's not a data silo.  
11 You can't -- you can see the data -- if you have a computer,  
12 you can access this information very easily. If you don't  
13 have a computer and want to put it in your standalone  
14 navigation system, you're out of luck.

15 MR. WARD: I see.

16 MR. ORR: Without scraping the screen off of web  
17 pages, you know, scripting the data, and then creating a  
18 database, which you can then upload to your Garmin or TomTom  
19 or Magellan or what have you.

20 MR. WARD: I'm going to be meeting with the DOE  
21 next week on the Clean Cities briefing. We're going to be  
22 meeting with the Clean Cities people next week, so I'll  
23 bring that to their attention that they still have a little  
24 bit more work to do.

25 MR. ORR: Again, I made a database, which I'm not



1 going to say is complete. It covers the U.S. and Canada.  
2 Because I'm also interested -- and I can tell many war  
3 stories about having to drive a CNG vehicle on the East  
4 Coast, which was ugly. But the -- in terms of cross country  
5 driving a CNG vehicle, it would be easier to drive a  
6 gasoline vehicle across the country in 1906 than it would be  
7 to drive a CNG vehicle across country in 2010.

8 MR. WARD: Well taken. I'll mention that to them  
9 for sure.

10 MR. ORR: But that's all I have, so --

11 MR. WARD: Maybe I'll pass your name on to them  
12 and see if they can contact you and --

13 MR. ORR: I presume -- will these presentations be  
14 on your website at some point?

15 MS. BAROODY: Yes.

16 MR. ORR: Okay. Good.

17 MS. BAROODY: Yes. They'll be there. Hopefully  
18 within a week.

19 MR. ORR: All right.

20 MS. BAROODY: Thank you so much.

21 Anybody else? Anymore comments? I don't -- those  
22 online, we're unmuting you if you want to speak.

23 MR. WARD: Hearing none. Well, I want to thank  
24 you all for staying until the -- to the final conclusion of  
25 this. It went a little longer than we expected, but I think

1 we got a lot of very good information from you all. And -  
2 - and all those folks that are on the web, thank you for  
3 sticking it out as well and -- and joining our process, and  
4 please watch our web page and sign up on our list serve if  
5 you get an opportunity so that the next time we surface, you  
6 will be notified, automatically pushing the information to  
7 you. You won't have to go and retrieve it.

8 MS. BAROODY: And also, any comments are due to  
9 the docket by September 28th. So that concludes our time.  
10 Thanks again for all your wonderful presentations.

11 (Whereupon, at 4:41 p.m., the workshop was adjourned.)

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## CERTIFICATE OF REPORTER

I, LEE MILLER, an Electronic Reporter, do hereby certify that I am a disinterested person herein; that I recorded the foregoing California Energy Commission Workshop; that it was thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for any of the parties to said meeting, nor in any way interested in outcome of said meeting.

IN WITNESS WHEREOF, I have hereunto set my hand this 28th day of September, 2009.

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Lee Miller, AAERT No. D-417